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Pulpwood Production in the North-Central Region, 1999

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CONTENTS

Page

Lake States **3**

Production 3

Receipts 14

Industry Trends and Analysis 16

Central States **21**

Production 21

Receipts 22

Industry Trends and Analysis 22

Plains States **25**

Production 25

Appendix **27**

Table Titles **28**

Tables **29**

Pulpwood Production in the North-Central Region, 1999

Ronald J. Piva

NOTE: This report includes all primary products made from reconstituted wood fiber. In addition to wood pulp, this includes particleboard and engineered lumber products made from chips, shavings, wafers, flakes, strands, and sawdust. This report presents the production by county of the raw fiber material delivered to mills. Thus, these data report only that portion of the timber harvest used as raw material and do not necessarily reflect the volume of growing stock harvested.

Pulpwood constitutes more than half the industrial timber products harvested annually in the Lake States (Michigan, Minnesota, and Wisconsin) and is an important product in the Central States (Illinois, Indiana, Iowa, and Missouri) and the Plains States (Kansas, Nebraska, North Dakota, and South Dakota).

Current detailed information about pulpwood production[1] is necessary for intelligent planning and decisionmaking in wood procurement, forest resource management, forest industry development, and scientific studies.

Since 1979, we have included logs, bolts, and wood residue used in manufacturing flakeboard, waferboard, oriented strandboard, and medium density fiberboard in this annual report. Engineered lumber was first included in this report in 1992. Together, these products are called particleboard, and all mills manufacturing these boards are called particleboard mills in this report. Wood used at particleboard mills is identical or nearly identical to wood used at pulp mills; therefore, including this wood in our study provides a more accurate estimate of demand for pulpwood-like material.

Particleboard mills were in their infancy before 1979 and used primarily aspen and wood residue. Therefore, data for these mills do not distort roundwood use trends for other species or preclude comparing 1999 survey results with those of 1978 and previous years.

Pulp and particleboard mills using timber from the North Central States in 1999 reported their pulpwood receipts[2] by species group and county of origin. This report presents the results of the survey, analyzes the data, compares results with those of 1998 and earlier years, and discusses trends in pulpwood production and use.

The Lake States, Central States, and Plains States are discussed separately because the timber types in each area are different, the flow of wood between the areas is nominal, and more detailed data on pulpwood production and receipts in the Central and Plains States might reveal the operations of individual mills. This is the 41st annual report of the pulpwood harvest in Lake States counties, the 40th annual report of the Central States harvest, and the 7th report of the pulpwood harvest in the Plains States.

About the Author:

Ronald J. Piva, Forester, received a B.S. degree in forest management from the University of Missouri-Columbia. He joined the Forest Service in 1987 and has been working with the North Central Station's Forest Inventory and Analysis unit since.

[1] *Pulpwood production, determined from mill receipts, is the annual volume of pulpwood cut, plus the annual wood residue volume produced by sawmills, veneer mills, etc. used for pulp, particleboard, waferboard, oriented strandboard, medium density fiberboard, or engineered lumber.*

[2] *Pulpwood receipts are the volumes of wood received by mills in a specific State or region, regardless of the geographic source.*

Several mills purchase their pulpwood based on weight rather than volume. Factors used to convert green tons of pulpwood to standard cord equivalents are shown in the appendix.

When new surveys are completed, errors and omissions from previous surveys are corrected. As a result of our ongoing efforts to improve the survey's efficiency and reliability, changes may have been made to the previous survey's data. All comparisons and analysis in this report are based on the reprocessed data from earlier surveys, which may not match earlier published data.

LAKE STATES

PRODUCTION

- Pulpwood production in the Lake States as a whole increased by almost 4 percent from 1998 to 1999, to 9.6 million cords[3]. Of each cord produced, 89 percent came from roundwood (including chips from roundwood) and 11 percent came from the residue[4] of wood-using plants (fig. 1).

- Hardwood material constituted 77 percent of the total pulpwood production.

- Principal species of roundwood harvested in 1999 were aspen (4.1 million cords), soft maple (669 thousand cords), hard maple (665 thousand cords), jack pine (549 thousand cords), and white birch (439 thousand cords) (table 1).

- Aspen remained the dominant species of pulpwood roundwood harvested—49 percent of the total roundwood produced in the Lake States in 1999.

- Softwood roundwood production decreased by 11 thousand cords from 1998 to 1999. Pulpwood production from softwood residues rose by 81 thousand cords, an increase of 22 percent from the previous year (fig. 2).

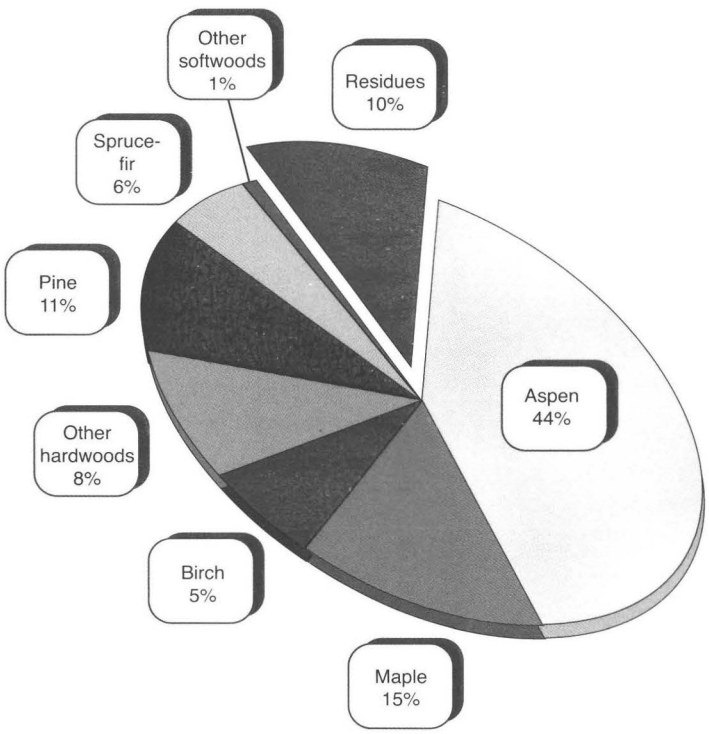


Figure 1.—*Lake States pulpwood production by species group and residues, 1999.*

[3] *All references to cords are in standard cords. A standard cord is 128 cubic feet of wood, bark, and air space.*

[4] *Residue is the byproduct from sawmills, veneer mills, cooperage mills, and other wood-using mills that is used for pulping and particleboard. Residue includes slabs, edgings, veneer cores, sawdust, fines, woodflour, and chips manufactured from slabs, edgings, and veneer cores.*

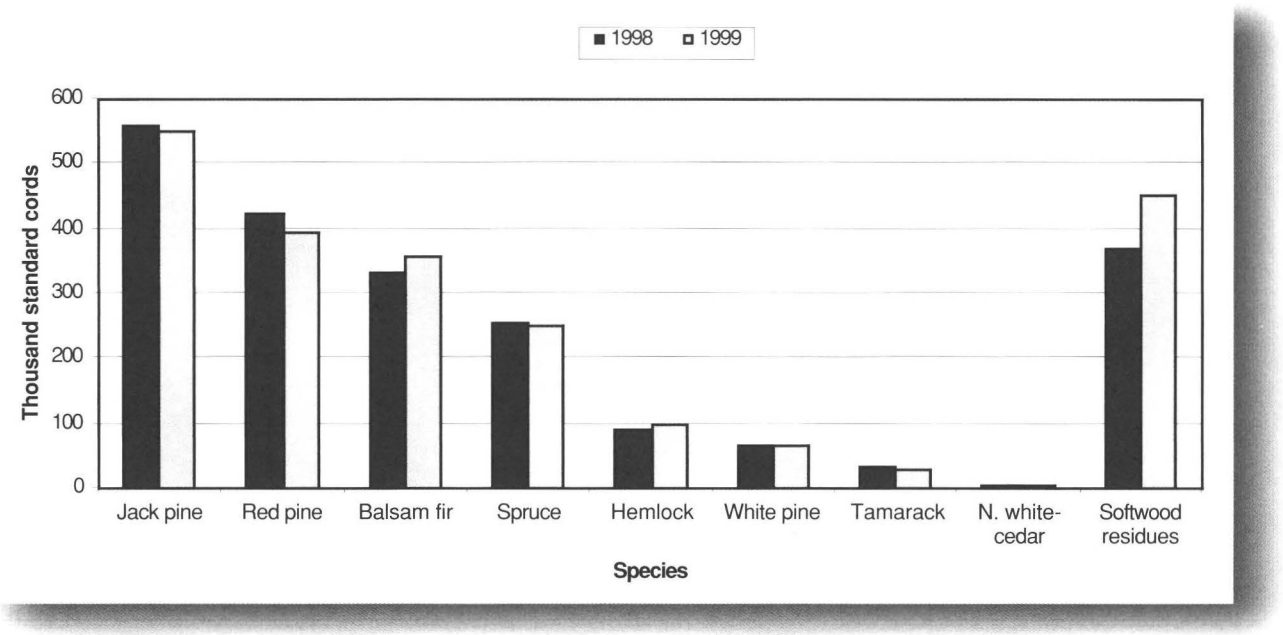


Figure 2.—*Softwood pulpwood production in the Lake States, 1998-1999.*

- Hardwood roundwood production increased by 4 percent, from 6,464 thousand cords in 1998 to 6,732 thousand cords in 1999. Pulpwood production from hardwood residue increased by 1 percent during the same period (fig. 3).

- Whole-tree chip[5] (WTC) production made up 7 percent of the total pulpwood production or 674 thousand cords in the Lake States in 1999, less than a 1-percent decrease from the previous year. Compared to 1998 production levels, hardwood WTC production in 1999 increased by 1 percent and softwood WTC production decreased by 17 percent (fig. 4).

- Michigan was the major producer of WTC in the Lake States in 1999 with 433 thousand cords (64 percent of the WTC production) (fig. 5).

- Aspen was the predominant species used in WTC in 1999 with 255 thousand cords or 38 percent of the total WTC production.

- Jack pine was the predominant softwood species used in WTC in 1999, making up 80 percent of the softwood WTC production and 9 percent of the total WTC production.

Michigan

- Michigan pulpwood production rose by 30 thousand cords to 3.1 million cords in 1999, an increase of just under 1 percent from 1998 (fig. 6 and table 2).

- In 1999, hardwoods accounted for 76 percent of Michigan's pulpwood production.

- Roundwood production for pulpwood decreased by 1 percent from 1998 to 1999, to 2.6 million cords (table 3).

- The Western Upper Peninsula was the top-producing region in the State in 1999 with 43 percent of the roundwood harvested (fig. 7 and table 4).

- Marquette County in the Western Upper Peninsula was the top producer of roundwood in the State with 246 thousand cords (table 5).

[5] *Pulpwood produced from chipping entire trees (all portions of the trees aboveground, except the stumps).*

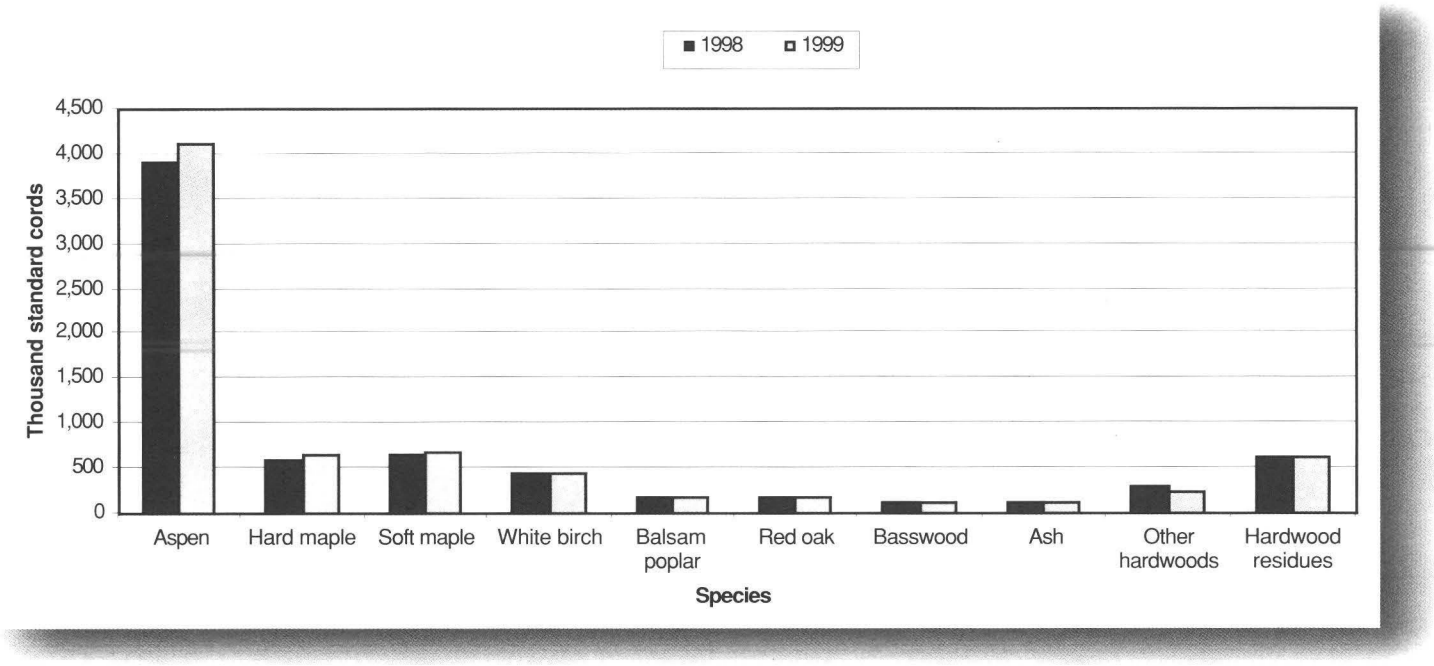


Figure 3.—*Hardwood pulpwood production in the Lake States, 1998-1999.*

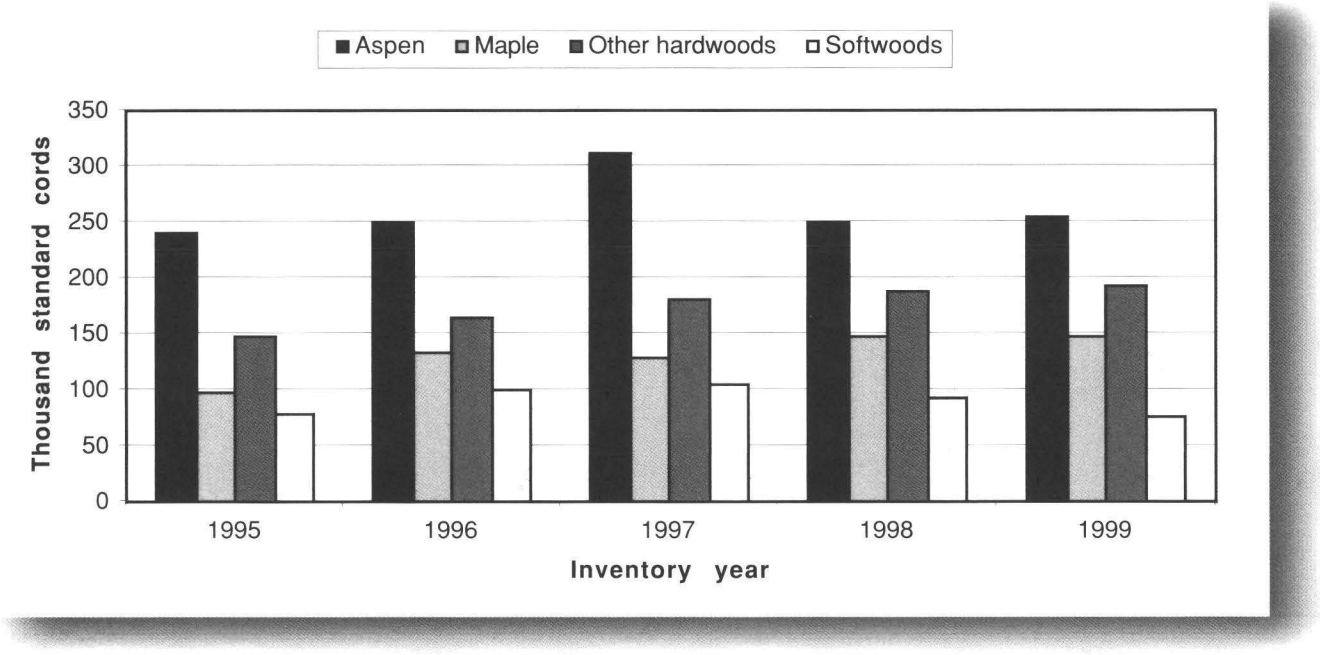


Figure 4.—*Whole-tree chip production in the Lake States, 1995-1999.*

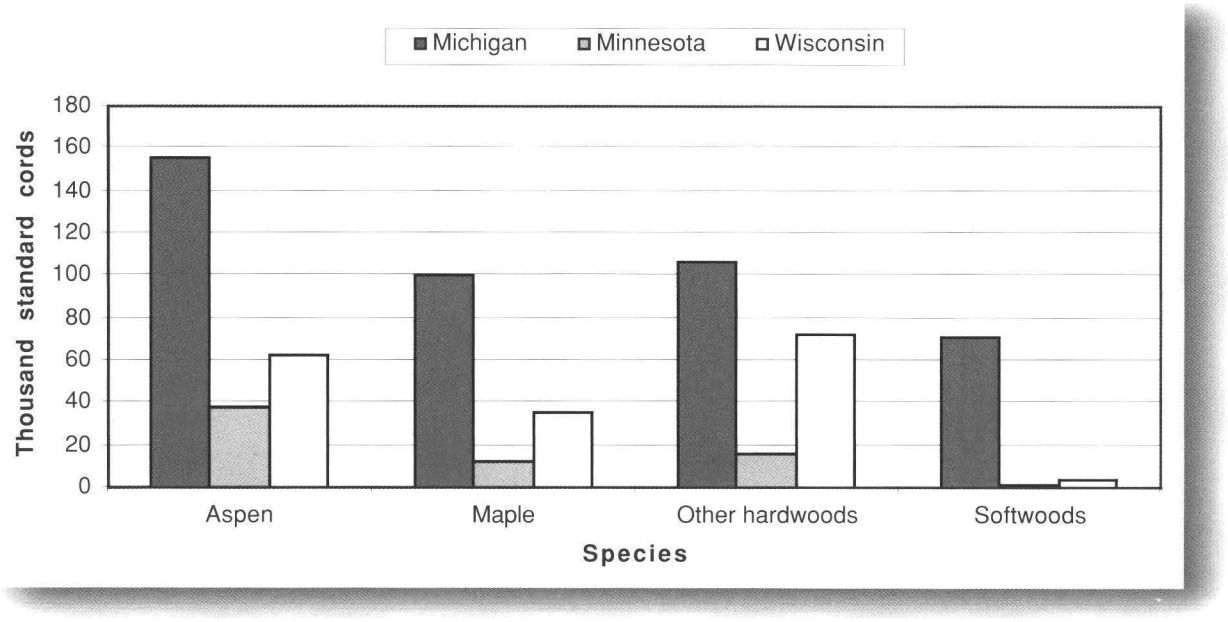


Figure 5.—*Whole-tree chip production by State in the Lake States, 1999.*

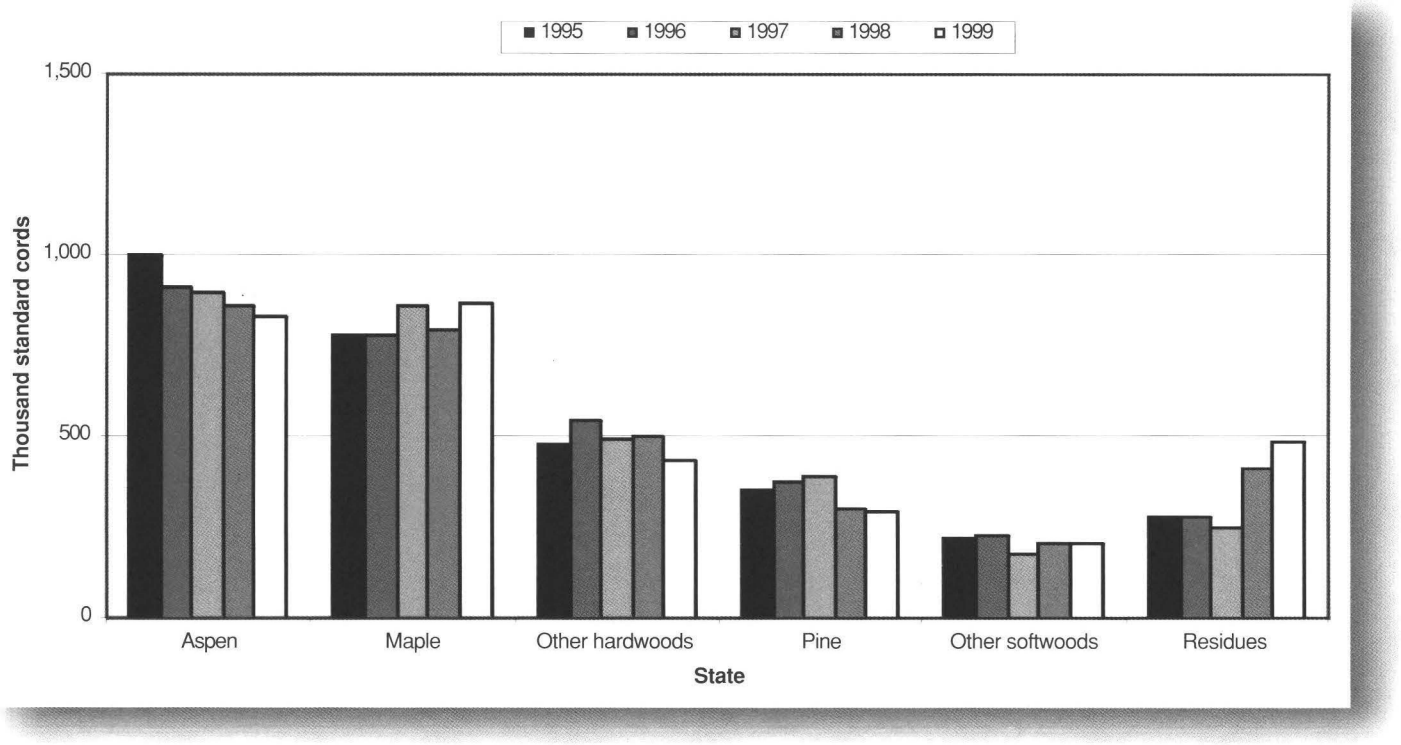


Figure 6.—*Michigan pulpwood production by species group and residues, 1995-1999.*

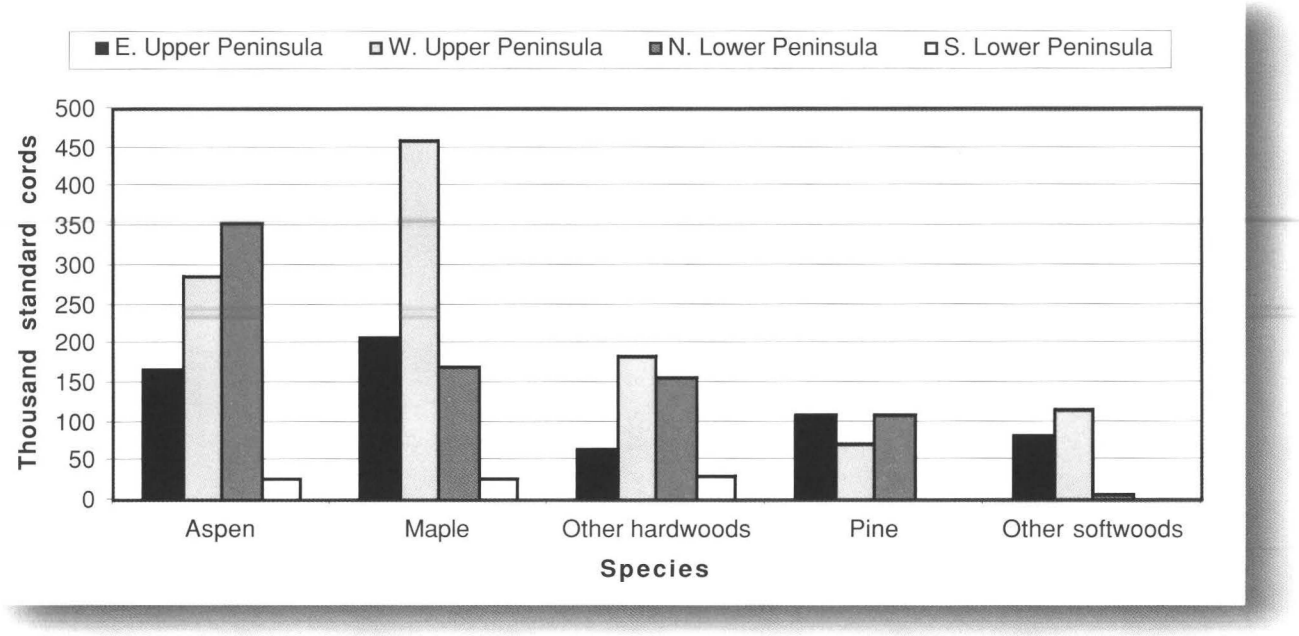


Figure 7.—*Michigan roundwood pulpwood production by Forest Survey Unit and species groups, 1999.*

- From 1998 to 1999, roundwood pulpwood production increased by 6 percent in the Eastern Upper Peninsula, decreased by 1 percent in both the Western Upper Peninsula and Southern Lower Peninsula, and decreased by 6 percent in the Northern Lower Peninsula.

- The production of pulpwood from residues increased by 17 percent from 1998 to 1999, rising from 414 thousand cords to 483 thousand cords.

Minnesota

- Pulpwood production increased by 4 percent from 1998 to 1999, from 3.0 million cords to 3.1 million cords (fig. 8).

- Hardwoods accounted for 83 percent of the total pulpwood produced in 1999.

- Ninety-five percent of the pulpwood produced came from roundwood.

- The Northern Pine and the Aspen-Birch Units were the top pulpwood-producing roundwood regions in the State in 1999 with 1.4 million cords and 1.2 million cords, respectively (fig. 9).

- St. Louis County in the Aspen-Birch Unit remained the top roundwood-producing county with 582 thousand cords, followed by Itasca County in the Northern Pine Unit with 429 thousand cords (table 6).

- Aspen pulpwood production increased by 8 percent between 1998 and 1999. Aspen accounted for 80 percent of all the roundwood harvested for pulpwood in Minnesota.

- From 1998 to 1999, pulpwood production from softwood residues decreased by 15 percent and hardwood residue use decreased by 9 percent. Overall, the use of mill residues produced in Minnesota and used for pulpwood production decreased by 12 percent.

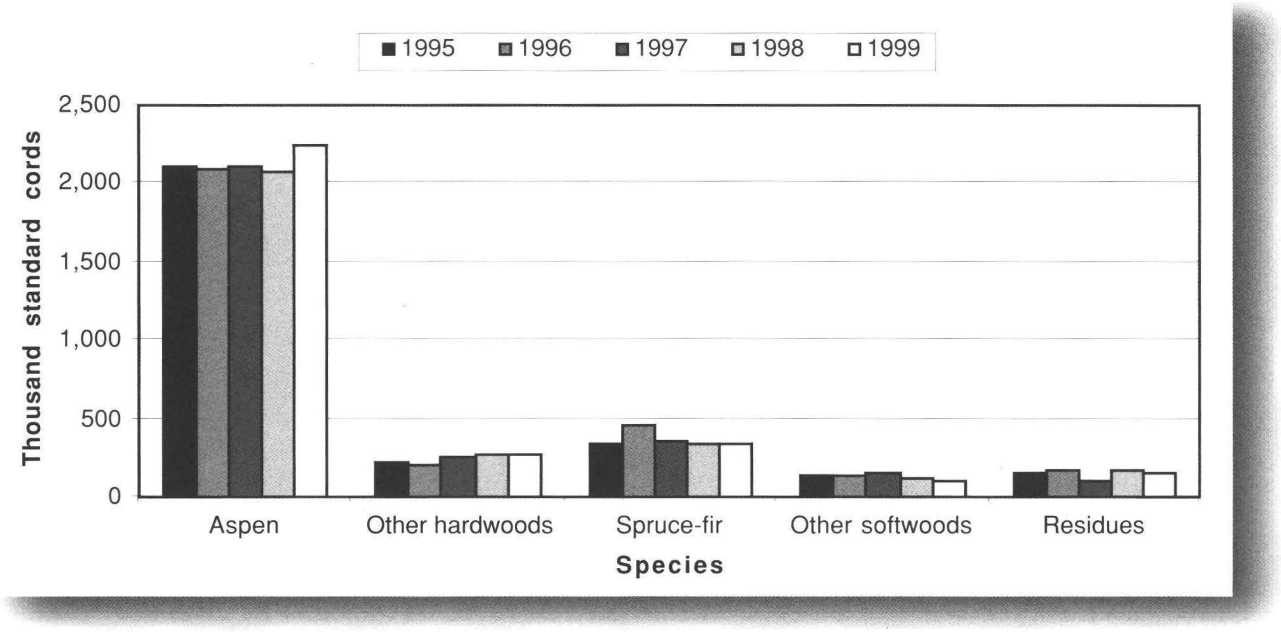


Figure 8.—*Minnesota pulpwood production by species group and residues, 1995-1999.*

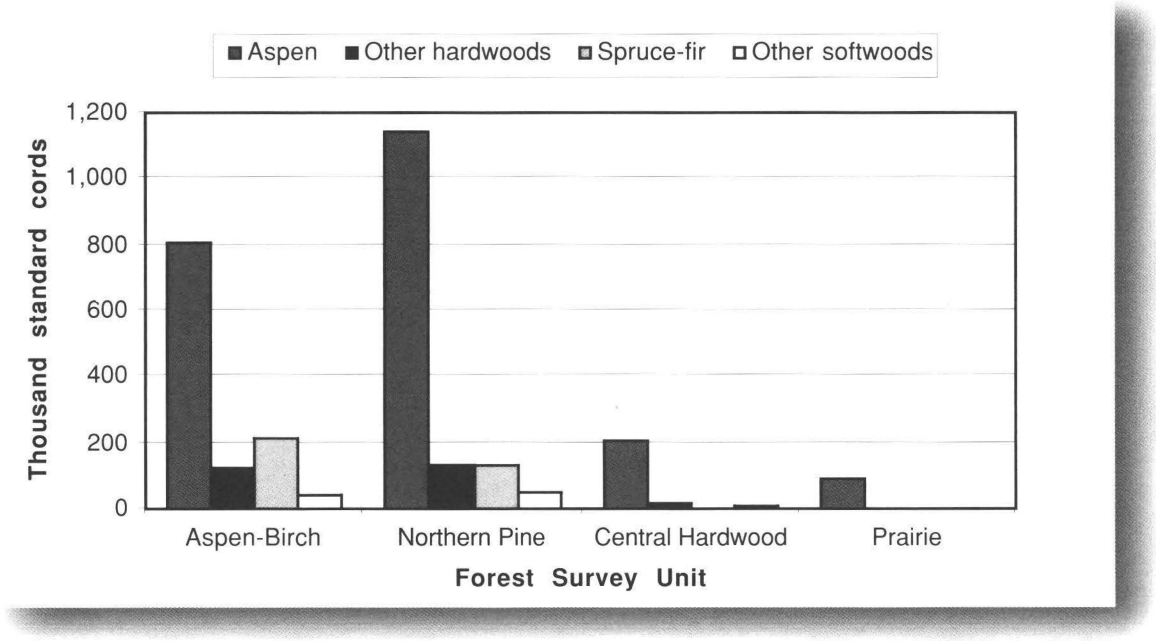


Figure 9.—*Minnesota roundwood pulpwood production by Forest Survey Unit and species group, 1999.*

Wisconsin

- Pulpwood production in Wisconsin increased by almost 6 percent from 1998 to 1999, to 3.3 million cords (fig. 10).
- Hardwoods accounted for 72 percent of the total pulpwood production in 1999.
- Roundwood harvested for pulpwood accounted for 87 percent of the pulpwood produced in 1999.
- The Northwestern Forest Survey Unit remained the top producer of roundwood for pulping in the State with 1.2 million cords (fig. 11).
- Bayfield County replaced Sawyer County in 1999 as the top pulpwood-producing county in the State with 220 thousand cords (table 7).
- Between 1998 and 1999, aspen harvests increased by 7 percent to 1.0 million cords.
- In 1999, the use of hardwood residues for pulpwood increased by 11 percent from the previous year, and the use of softwood residues increased by 9 percent.

Harvesting Intensity

- In the following figures, the distribution of the harvest is shown in two ways: first, the amount of pulpwood cut relative to the growing-stock volume in each of five major pulpwood species (fig. 12); second, the amount of pulpwood relative to commercial timberland area (fig. 13).

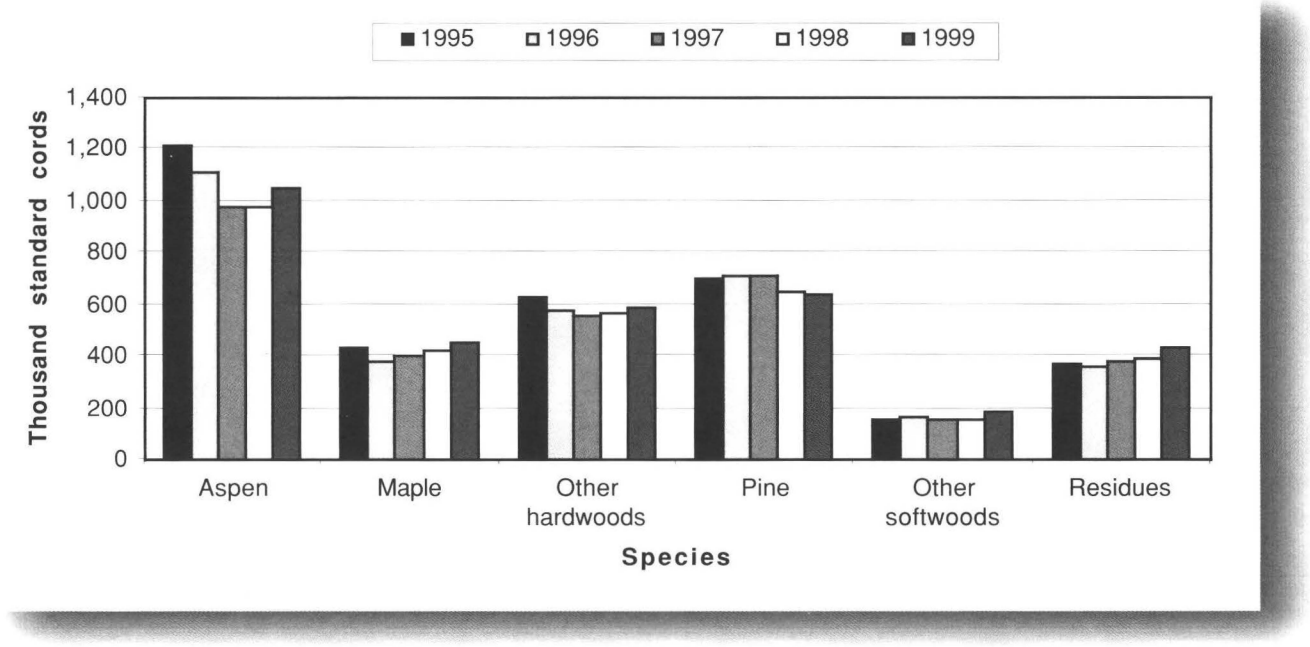


Figure 10.—*Wisconsin pulpwood production by species group and residues, 1995-1999.*

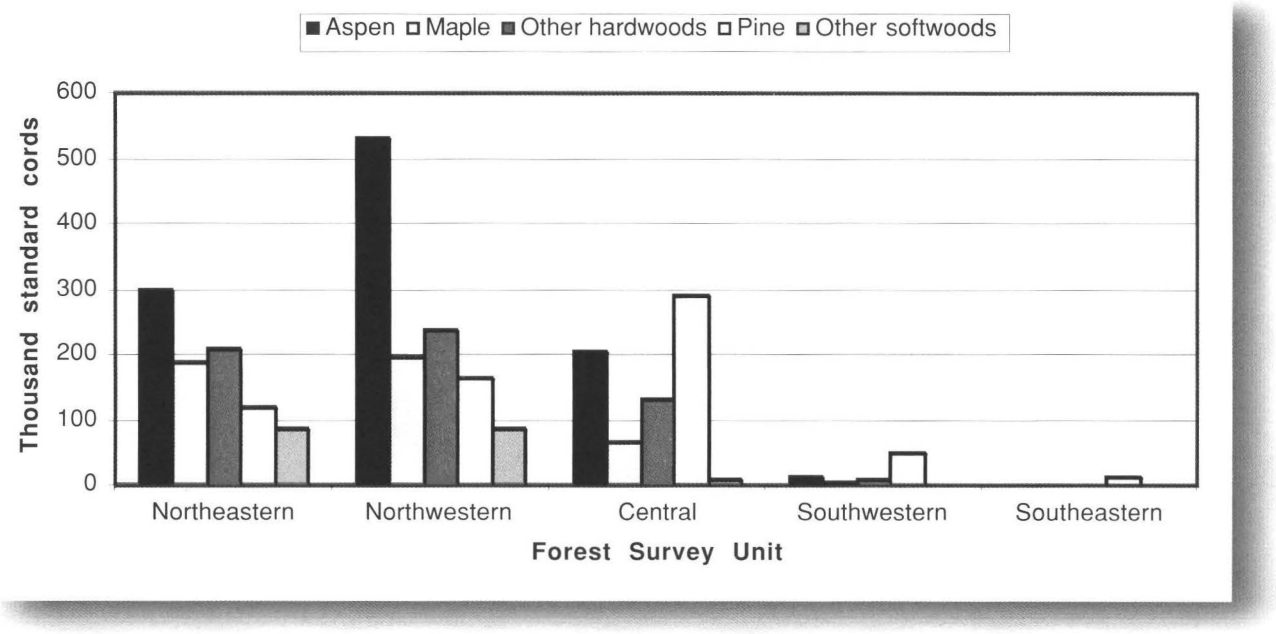


Figure 11.—*Wisconsin roundwood pulpwood production by Forest Survey Unit and species group, 1999.*

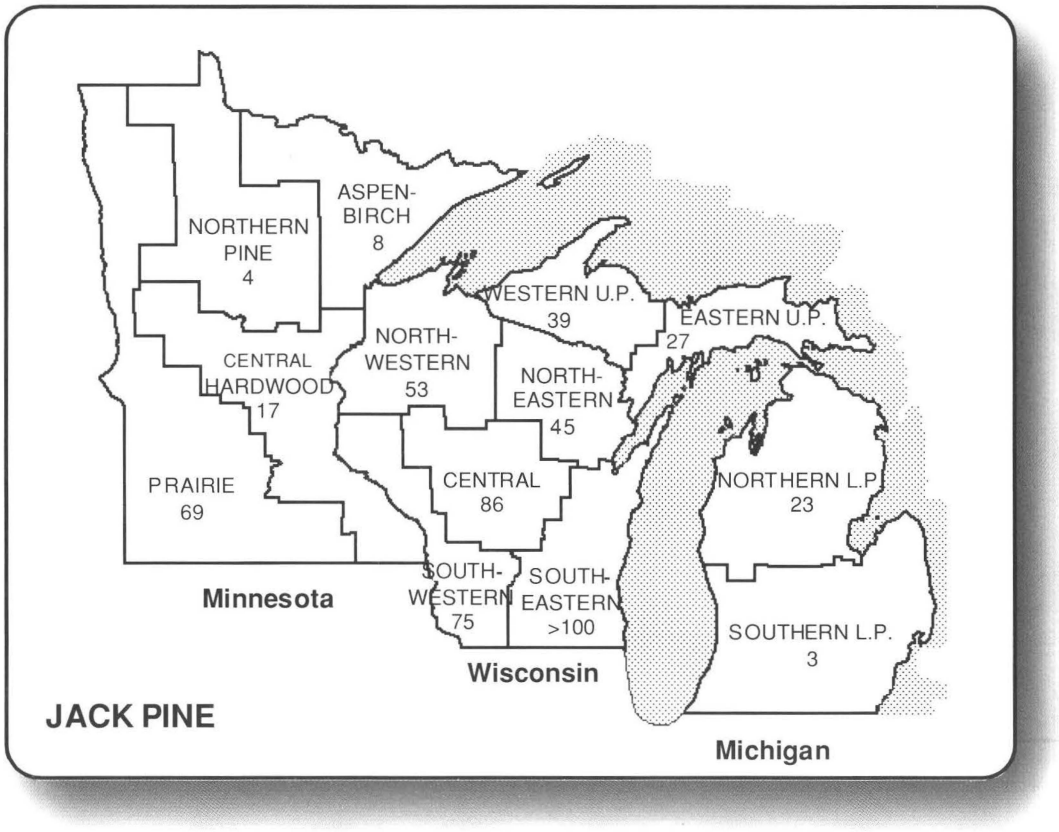
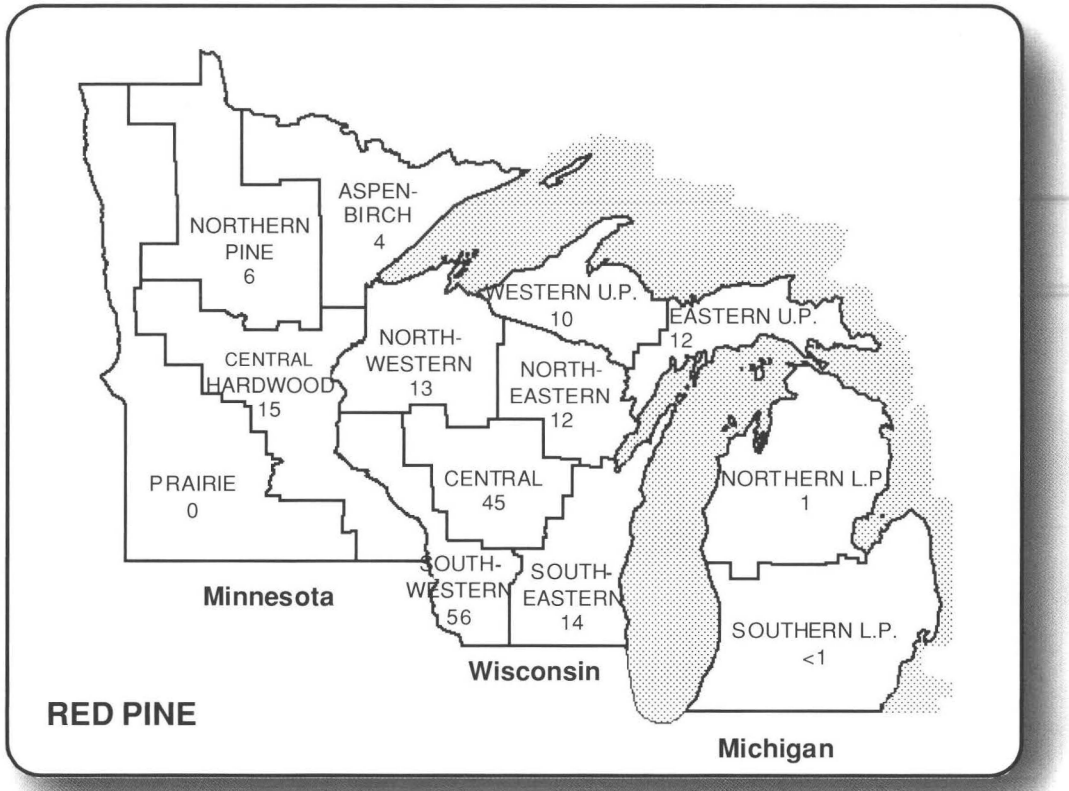


Figure 12.—*Cords of roundwood pulpwood (including chips from roundwood) harvested per 1,000 cords of growing-stock volume for each of five principal pulpwood species by Forest Survey Unit, 1999. Growing-stock volume was determined during the last forest inventory for each State.*


ASPEN-
BIRCH
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PINE
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WESTERN U.P.
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EASTERN U.P.
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NORTH-
WESTERN
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NORTH-
EASTERN
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CENTRAL
HARDWOOD
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PRAIRIE
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CENTRAL
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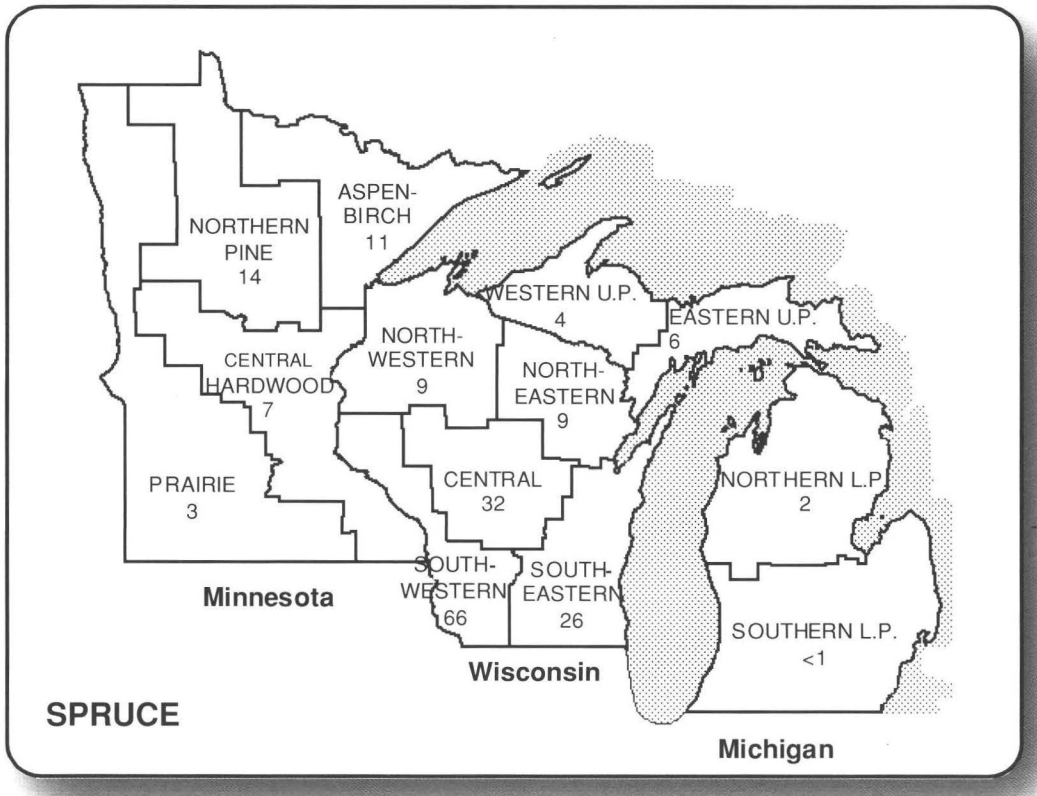
Wisconsin
Michigan
RED PINE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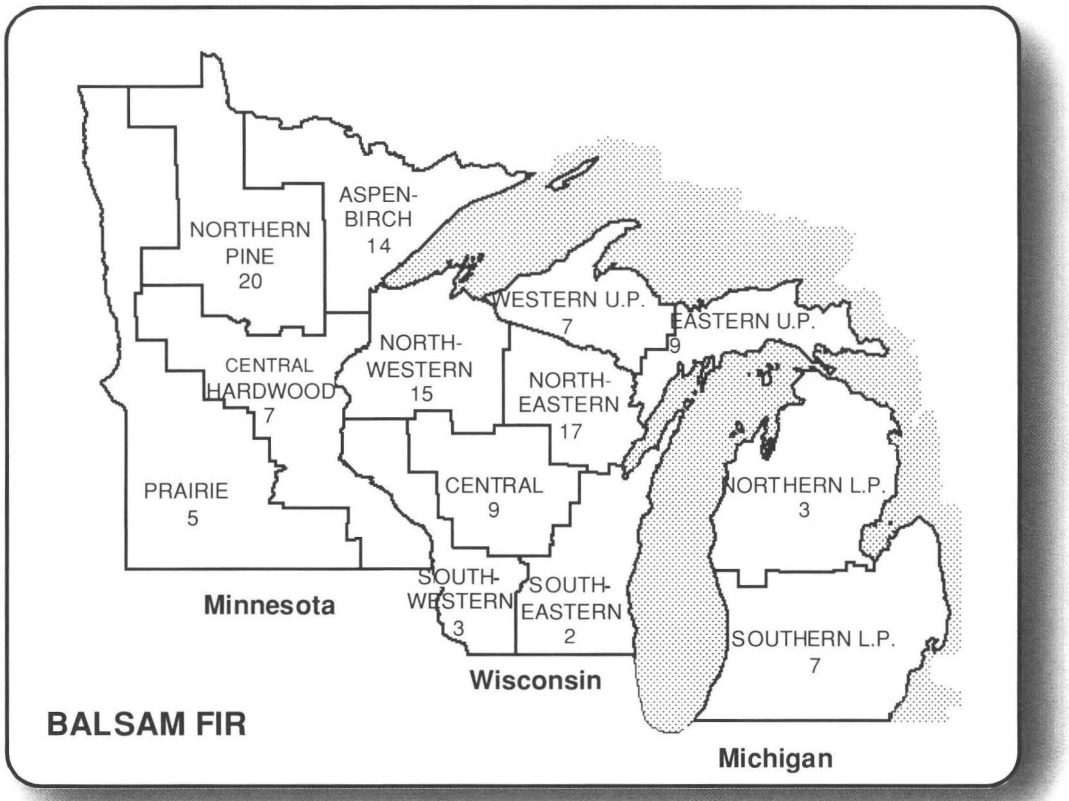
ASPEN-
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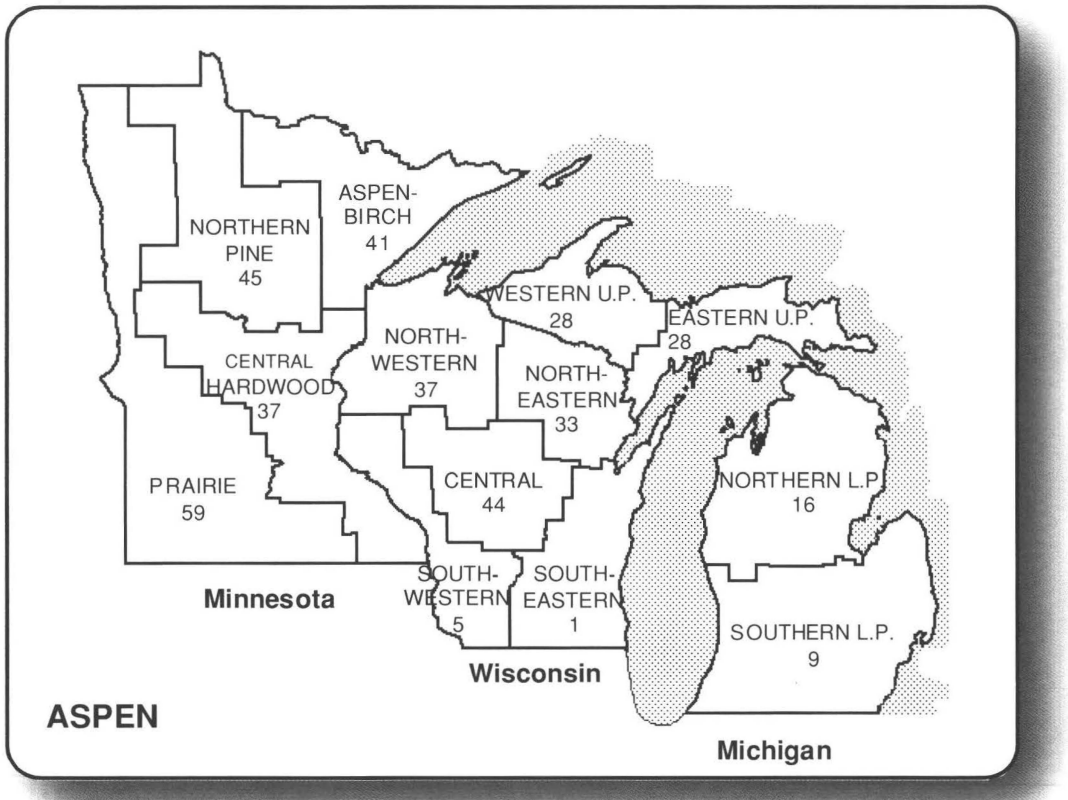
BALSAM FIR


ASPEN-
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NORTH-
EASTERN
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CENTRAL
HARDWOOD
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PRAIRIE
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CENTRAL
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Wisconsin
Michigan
ASPEN

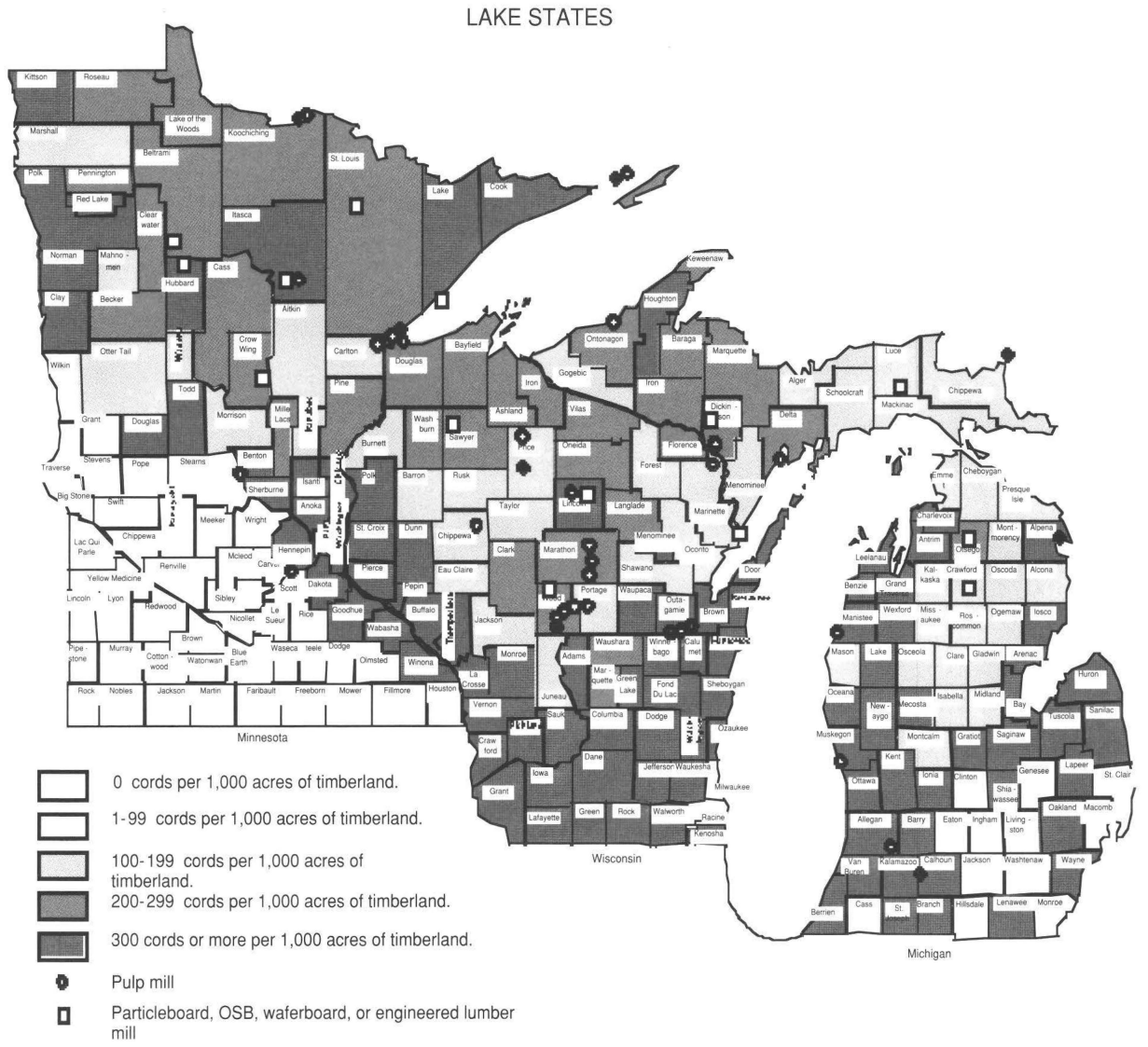
LAKE STATES
Minnesota
Wisconsin
Michigan
0 cords per 1,000 acres of timberland.
1-99 cords per 1,000 acres of timberland.
100-199 cords per 1,000 acres of timberland.
200-299 cords per 1,000 acres of timberland.
300 cords or more per 1,000 acres of timberland.
Pulp mill
Particleboard, OSB, waferboard, or engineered lumber mill

Figure 13.—*Cords of pulpwood cut per 1,000 acres of timberland by county, 1999. Acres of timberland (stocking of trees greater than 10 percent) were determined during the last inventory in each State. Locations of active pulp and particleboard mills are shown.*

Pulpwood harvesting was most intensive (100,000 cords or more) in the following Forest Survey Units by species:

Species	State	Forest Survey Unit
Balsam fir	Minnesota	Aspen-Birch
Jack pine	Wisconsin	Central, Northwestern
Red pine	Wisconsin	Central
Spruce	Minnesota	Aspen-Birch
Aspen	Michigan	N. Lower Peninsula, W. Upper Peninsula, E. Upper Peninsula
	Minnesota	Northern Pine, Aspen-Birch, Central Hardwood
	Wisconsin	Northwestern, Northeastern, Central
White birch	Wisconsin	Northwestern
Hard maple	Michigan	W. Upper Peninsula, E. Upper Peninsula
	Wisconsin	Northwestern, Northeastern
Soft maple	Michigan	W. Upper Peninsula, N. Lower Peninsula, E. Upper Peninsula

RECEIPTS

- In 1999, 33 woodpulp and 14 particleboard mills in the Lake States acquired 9.8 million cords of pulpwood, an increase of 3 percent from 1998.
- Aspen roundwood was processed at 37 of the 47 pulp and particleboard plants in the Lake States in 1999 (fig. 14 and table 8).
- In 1999, Wisconsin supplied wood to 34 mills, Michigan supplied 33 mills, and Minnesota supplied 24 mills.
- Total imports from outside the Lake States of all wood material in 1999 were 303 thousand cords, a decrease of 9 percent from 1998. Canada contributed 58 percent of the total import receipts.

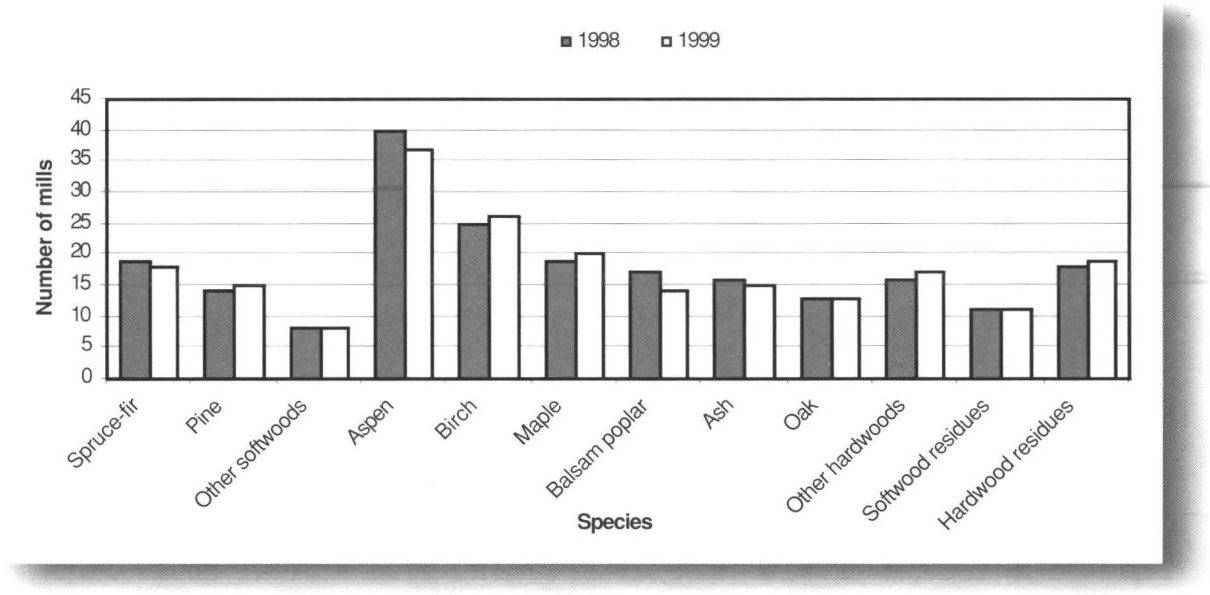

Figure 14.—*Numbers of industrial plants in the Lake States using a particular species or residue for pulping and particleboard, 1998-1999.*

- Total imports of roundwood decreased by 28 percent, from 194 thousand cords in 1998 to 138 thousand cords in 1999. Decreases in imports of spruce and aspen roundwood accounted for more than 70 percent of the decrease in volume of roundwood shipped to the Lake States.

- Canada supplied 98 percent of the total roundwood volume imported.

- Imports of residues increased by 17 percent in 1999. Residues from the Plains States and other Western States made up almost two-thirds of the total residues imported by mills in the Lake States.

Michigan

- The eight Michigan pulp mills, three OSB mills, and one particleboard mill consumed 3.0 million cords in 1999, down 1 percent from the previous year. Eight percent of the total wood material consumed was imported from out of State, mainly from Wisconsin.

Minnesota

- The eight pulp mills, five OSB mills, and one laminated structural lumber mill in Minnesota reported consuming an estimated 3.0 million cords in 1999, an increase of 6 percent from 1998. Only 6 percent of Minnesota's consumption for pulpwood came from out-of-State sources. Canada supplied over 60 percent of the imported wood material.

Wisconsin

- The 17 pulp mills, 2 OSB mills, and 2 particleboard mills in Wisconsin consumed 3.7 million cords in 1999, up by almost 4 percent from 1998. Eighteen percent of the total receipts were imported from out of State. Imports from Michigan and Minnesota accounted for 46 percent and 33 percent of the total imports, respectively.

INDUSTRY TRENDS AND ANALYSIS

Pulp Mills

For this section pulp mill products include wood fiber products such as paper, paperboard, hardboard, insulation board, and medium-density fiberboard. All of these products are manufactured from wood that has been reduced to individual fibers, small fiber bundles, or fiber parts that are subsequently formed into a mat. Wood material from the Lake States sent to mills in other States and Canada is included.

- Of the 9.8 million cords of pulpwood processed in 1999, 6.8 million cords (70 percent) were used for wood pulp products. Of each cord used to produce pulp, 85 percent came from roundwood and 15 percent came from mill residues.

- Principal species harvested for pulp in the Lake States in 1999 were aspen (1,981 thousand cords), hard maple (629 thousand cords), soft maple (587 thousand cords), jack pine (447 thousand cords), and red pine (363 thousand cords) (fig. 15).

- Hardwoods were still the mainstays of the pulp mills in the region in 1999 with hardwood roundwood contributing 63 percent of total production and hardwood residues supplying another 8 percent.

- The use of softwood roundwood by the pulp mills in the Lake States decreased by 4 percent from 1998 to 1999. Softwood residue use, on the other hand, increased by 18 percent from the previous year.

- Average daily woodpulp production in 1999 rose to 15.1 thousand tons of pulp per day, up from 15.0 thousand tons per day in 1998 (table 9).

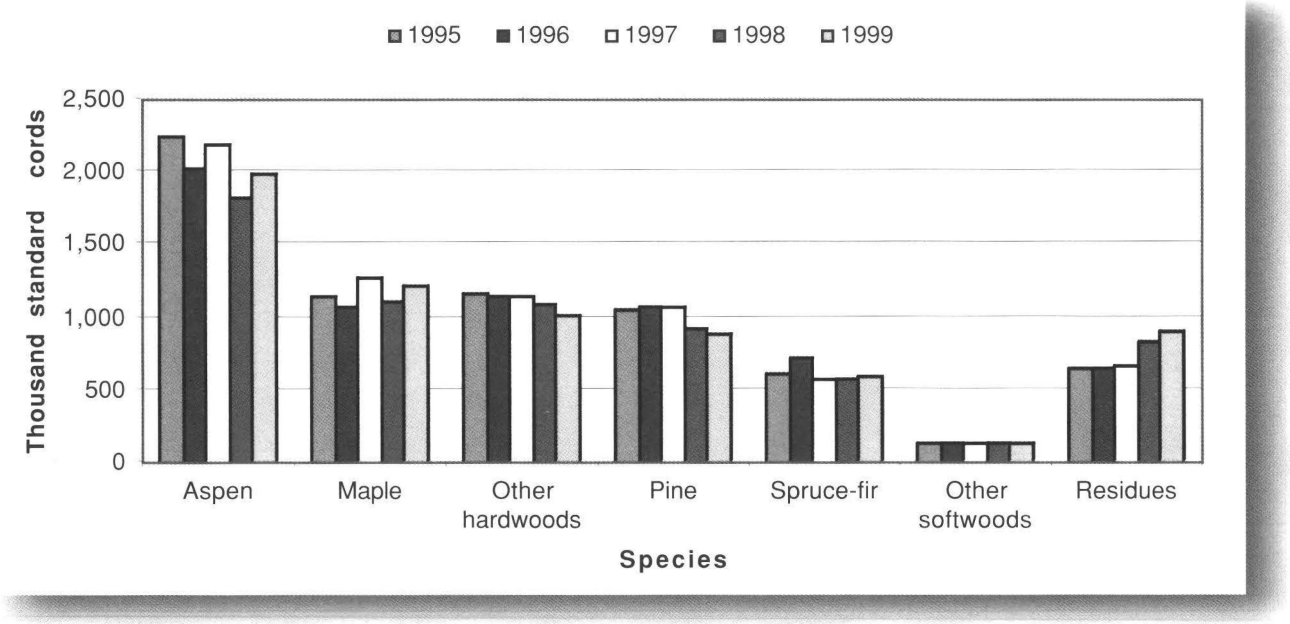

Figure 15.—*Pulpwood production in the Lake States for pulp by species group and residues, 1995-1999.*

- Lake States pulpwood production for pulp mills during the period 1995-1999 was:

Product form and species group	Production				
	1995	1996	1997	1998	1999
	(Thousand cords)				
Roundwood					
Softwoods	1,776	1,920	1,788	1,627	1,599
Aspen	2,241	2,018	2,036	1,825	1,981
Other hardwoods	2,291	2,209	2,268	2,198	2,232
Residue	642	630	649	812	787
Total	6,949	6,778	6,741	6,463	6,600

Michigan

- Pulpwood production for wood pulp was 2.2 million cords in 1999, up by 2 percent from 1998.

- Hard maple and soft maple were the two major pulpwood species groups harvested in the State in 1999 with 389 thousand cords and 384 thousand cords, respectively. Other major species harvested were aspen with 301 thousand cords and jack pine with 119 thousand cords.

- Michigan mills imported 179 thousand cords of pulpwood, or 9 percent of the wood material used for the production of wood pulp. Michigan exported 314 thousand cords to wood pulp mills in Minnesota, Wisconsin, and Canada.

- Michigan mills used 1,684 thousand cords of hardwood material in 1999, an increase of less than 1 percent from 1998. The use of softwood material decreased by 3 percent to 347 thousand cords during the same period.

Minnesota

- Pulpwood production for wood pulp totaled 1.7 million cords in 1999, down 1 percent from 1998.

- In 1999, aspen was the predominant species harvested in the State with 1,010 thousand cords, 8 percent higher than the previous year. Other major species were balsam fir with 194 thousand cords and spruce with 149 thousand cords.

- Mills in Minnesota imported 135 thousand cords of wood material for pulp products (68 thousand cords from Canada, 62 thousand cords from Wisconsin, and 5 thousand cords from Michigan). Minnesota exported 120 thousand cords to Wisconsin and 39 thousand cords to Canada.

- Minnesota mills had a 4-percent increase in the use of hardwood material, from 1,174 thousand cords in 1998 to 1,215 thousand cords in 1999. The use of softwood material decreased by 3 percent to 436 thousand cords in 1999.

Wisconsin

- Pulpwood production for wood pulp products in 1999 increased by 5 percent from 1998, to 2.8 million cords.

- Aspen was the main species harvested with 663 thousand cords. Other major species harvested were jack pine (302 thousand cords), red pine (272 thousand cords), hard maple (233 thousand cords), white birch (214 thousand cords), and soft maple (195 thousand cords).

- Wisconsin mills imported 525 thousand cords of pulpwood: 288 thousand cords from Michigan, 120 thousand cords from Minnesota,

113 thousand cords from other States, and 16 thousand cords from Canada. Wisconsin exported 162 thousand cords to Michigan, 62 thousand cords to Minnesota, and 1 thousand cords to other States.

- Wisconsin pulp mills increased the use of hardwood material by 7 percent and softwood material by almost 3 percent from 1998 to 1999.

Particleboard Mills

Particleboard is a generic term for a panel manufactured from lignocellulosic material—commonly wood—essentially in the form of particles (as distinct from fibers). These materials are bonded together with synthetic resin or other suitable binder under heat and pressure by a process wherein the inter-particle bonds are created wholly by the added binder. Other materials may have been added during manufacture to improve certain properties. The many types of particleboard differ greatly in regard to size and geometry of the particle, the amount of resin (adhesive) used, and the density to which the panel is pressed. The major types of particles used for particleboard are shavings, flakes, wafers, chips, sawdust, strands, slivers, and wood wool (excelsior). Most particleboard in the U.S. is made from residues (shavings, sawdust, or chips), but some types require that roundwood (saw logs or pulpwood) be used. Waferboard and oriented strandboard are examples of products requiring that the particles be cut from solid wood. A new product called engineered lumber was added to this generic term in 1992. Wood material from the Lake States sent to mills in other States and Canada is included.

- The Lake States produced 2.9 million cords of pulpwood in 1999 for particleboard products, up 5 percent from 1998. For every cord of pulpwood used in particleboard manufacture, 93 percent came from roundwood and 7 percent came from the residues of other wood-using plants.

- Principal species harvested for particleboard products were aspen (2,139 thousand cords), white birch (137 thousand cords), jack pine (102 thousand cords), and soft maple (82 thousand cords) (fig. 16).

- In 1999, the Lake States produced 152 thousand cords of softwood roundwood and 2,519 thousand cords of hardwood roundwood for processing at particleboard plants. Roundwood production for the manufacture of particleboard products rose by 4 percent between 1998 and 1999. All the roundwood that was harvested in the Lake States for particleboard production stayed in the region.

- The Lake States in 1999 produced 116 thousand cords of softwood residues and 89 thousand cords of hardwood residues for use in particleboard production. The use of residues for particleboard production increased by 19 percent from 1998 to 1999.

- Annual production at Lake States particleboard plants fell from 2,400 million square feet 3/4-inch basis in 1998 to 1,951 million square feet 3/4-inch basis in 1999 (table 10).

- Lake States pulpwood production for particleboard mills during 1995-1999 was:

Michigan

- In 1999, pulpwood harvested from Michigan for particleboard products totaled 816 thousand cords, of which 109 thousand cords were softwoods and 707 thousand cords were hardwoods. Residues used for particleboard products added another 133 thousand cords of wood material.

Product form and species	Production				
	1995	1996	1997	1998	1999
	(Thousand cords)				
Roundwood					
Softwoods	128	146	161	135	152
Aspen	2,079	2,102	1,946	2,078	2,139
Other hardwoods	245	281	306	362	380
Residue	163	179	86	172	205
Total	2,616	2,708	2,499	2,748	2,876

- The particleboard mills in Michigan imported 44 thousand cords from Wisconsin and 35 thousand cords from Canada. Exports of all wood material for particleboard production amounted to 47 thousand cords.

Minnesota

- Minnesota accounted for half of all the wood material produced in the Lake States for particleboard plants in 1999. Timber logged for particleboard products totaled 1.4 million cords, and aspen was the predominant species cut (1.2 million cords). Minnesota supplied less than 7 thousand cords of mill residues for particleboard production.

- The particleboard mills in Minnesota imported 42 thousand cords from Canada and less than 2 thousand cords from Wisconsin and North Dakota combined. In 1999, raw materials exported from the State for particleboard manufacturing totaled 95 thousand cords, all of which went to Wisconsin.

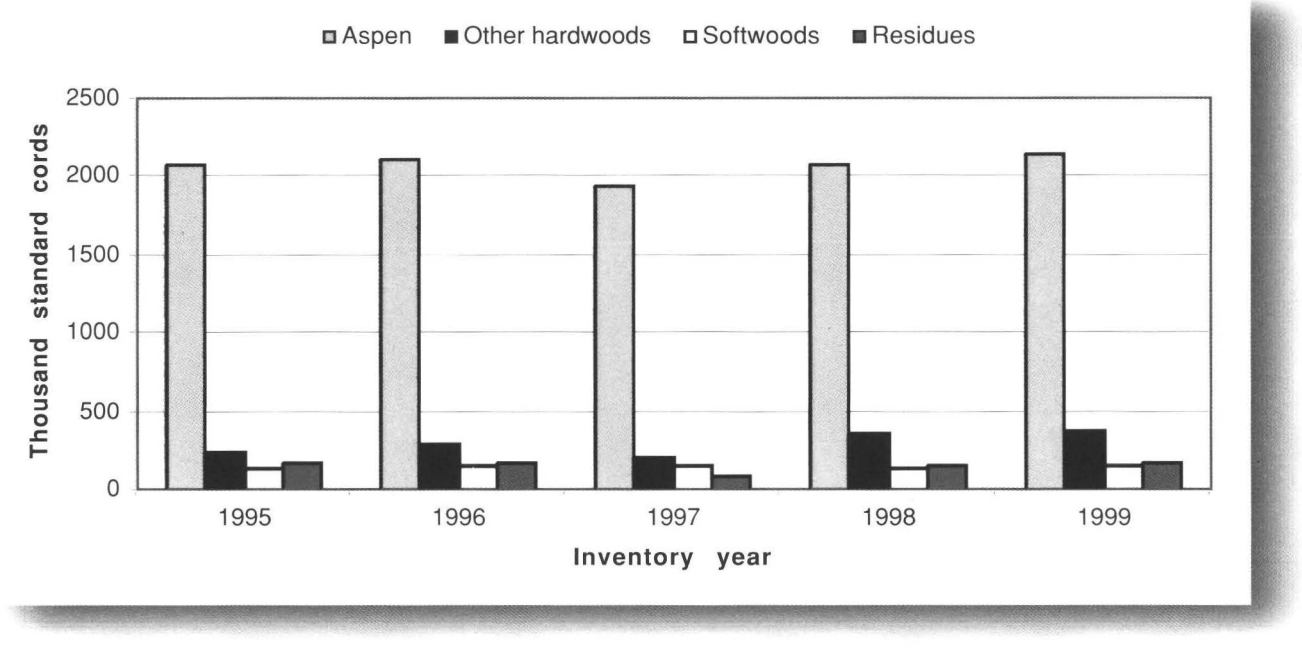

Figure 16.—*Pulpwood production for particleboard in the Lake States, 1995-1999.*

Wisconsin

- In 1999, Wisconsin produced 431 thousand cords of roundwood for particleboard manufacturing, of which 12 thousand cords were softwood and 419 thousand cords were hardwood. Wisconsin wood processing mills provided an additional 65 thousand cords of plant byproducts to the particleboard industry.

- The mills in Wisconsin imported almost 124 thousand cords of wood for particleboard manufacturing: 95 thousand cords from Minnesota, 18 thousand cords from Michigan, and 10 thousand cords from Canada. Wisconsin exported 44 thousand cords to Michigan particleboard mills and 2 thousand cords to Canadian particleboard mills in 1999.

Industry News

Major mill expansion, new construction, consolidations, name changes, and closures are as follows:

- American Fibrit, Inc., in Battle Creek, MI, changed its name to Johnson Controls in 1998.

- In 1999, Aspen Bay Pulp and Fibre began building the first bleached chemi-thermomechanical pulp mill in the U.S. in Menominee, MI. The 215,000 tpy (tons per year) mill should be finished in late 2002.

- Avenor, Inc., in Thunder Bay, Ontario, was purchased by and its name changed to Bowater Forest Products in 1998.

- Consolidated Papers, Inc., plants in Duluth, MN, and Biron, Kimberly, Niagara, Stevens Point, and Wisconsin Rapids, WI, were purchased by and their name was changed to Stora Enso North America in 1999.

- Georgia-Pacific Corp. in Duluth, MN, closed its pulp mill in March of 1999.

- Hennepin Paper Company in Little Falls, MN, closed its pulp mill in December of 1998.

- The TENNECO Packaging mills in Filer City, MI, and Tomahawk, WI, were purchased by and their names were changed to Packaging Corporation of America in 1999.

- Thilmany Paper in Kaukauna, WI, was purchased by and its name was changed to International Paper Company in 1999.

CENTRAL STATES

PRODUCTION

- Pulpwood production in the Central States (Illinois, Indiana, Iowa, and Missouri) decreased by 1 percent—from 472 thousand cords in 1998 to 466 thousand cords in 1999. Illinois and Missouri both increased production by less than 1 percent between 1998 and 1999, while Iowa's pulpwood production decreased by less than 1 percent and Indiana's fell by 4 percent.

- Pulpwood production from roundwood increased by 11 percent for the Central States as a whole from 1998 to 1999. Production of roundwood for pulp increased in Missouri by 21 percent from 1998 to 1999, increased by 13 percent in Illinois, decreased by 1 percent in Indiana, and decreased by 18 percent in Iowa.

- Roundwood made up 43 percent of the total wood material used for pulpwood production in the Central States in 1999 (table 11).

- Pulpwood production from soft hardwood[7] roundwood rose from 34 thousand cords in 1998 to 46 thousand cords in 1999. Hard hardwood[8] production increased from 126 thousand cords in 1998 to 142 thousand cords in 1999 (table 12 and fig. 17).

- Residue use for the production of pulpwood decreased by 9 percent from 1998 to 1999. The production of softwood residues used for pulp production fell by 48 percent and hardwood residue use decreased by 3 percent.

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[7] *Hardwood species with an average specific gravity of 0.50 or less.*

[8] *Hardwood species with an average specific gravity greater than 0.50.*

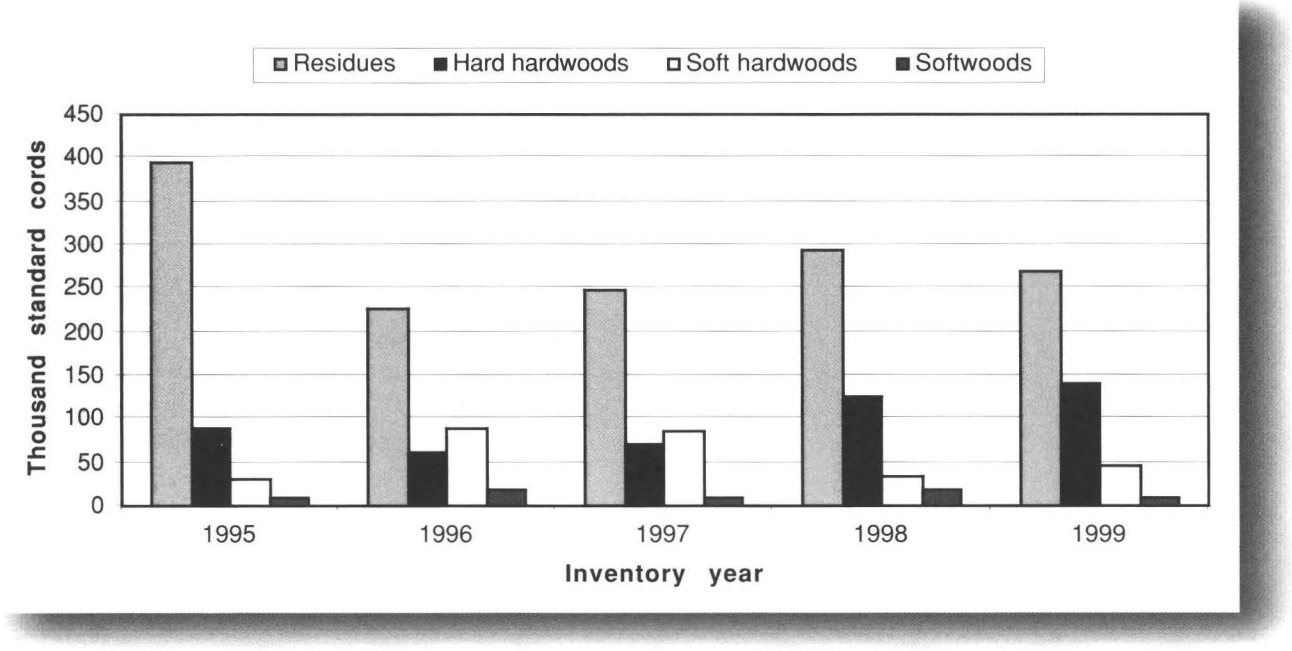

Figure 17.—*Pulpwood production in the Central States, 1995-1999.*

- Exports of roundwood and residues from the Central States in 1999 accounted for 72 percent of all wood material produced in the region for pulpwood production (table 13). Roundwood exports totaled 147 thousand cords and the export of residues from other wood-using mills totaled 184 thousand cords.

- Loggers harvested pulpwood in 20 counties in Illinois, 14 counties in Indiana, 12 counties in Iowa, and 13 counties in Missouri (fig. 18).

- Pulpwood production from whole-tree chips in 1999 increased by 13 percent from 1998. The 49 thousand cords of whole-tree chips made up almost one-quarter of the total roundwood produced in the Central States in 1999.

Illinois

- Illinois produced 79 thousand cords of pulpwood in 1999. Illinois contributed 17 percent of the total pulpwood production in the Central States in 1998 (fig. 19).

- Illinois does not have any primary wood pulp or particleboard mills; consequently, all pulpwood harvested is shipped to plants outside the State.

Indiana

- Pulpwood production in Indiana accounted for 38 percent of the total pulpwood produced in the Central States region. The 176 thousand cords of wood material produced in Indiana in 1999 is a 4-percent decrease from the 1998 level of 183 thousand cords.

- From 1998 to 1999, roundwood production decreased by 1 percent and residue production decreased by 4 percent.

Iowa

- Iowa's total pulpwood production in 1999 was 34 thousand cords, a decrease of less than 1 percent from 1998. The State contributed 7 percent of the region's total pulpwood produced.

- Residues accounted for over three-fourths of Iowa's pulpwood production in 1999.

Missouri

- Missouri was the largest producer of pulpwood in the Central States in 1999, with 38 percent of the region's total, or 177 thousand cords. The production of pulpwood in Missouri increased by a little over 1 thousand cords from 1998 to 1999.

- Missouri exported 93 percent (166 thousand cords) of the State's pulpwood production to mills in the Southern States.

RECEIPTS

- Pulp mills in three Central States received 144 thousand cords in 1999, up 4 percent from 1998 (table 13).

- Roundwood receipts increased by 13 percent—from 46 thousand cords in 1998 to 52 thousand cords in 1999—while residue receipts remained at 92 thousand cords.

- Softwood roundwood was not used for pulpwood by the Central States pulp mills.

INDUSTRY TRENDS AND ANALYSIS

- Average daily woodpulp production increased from 879 tons in 1998 to 891 tons in 1999 (table 14).

- In 1999, only 26 percent of the roundwood and 31 percent of the residues produced for pulpwood in the Central States went to pulp mills located in the Central States.

- Hardwood residue from sawmills and other wood-using mills accounted for 49 percent of all the wood material used by the Central States pulp mills. It continues to be the dominant form of wood material procured.

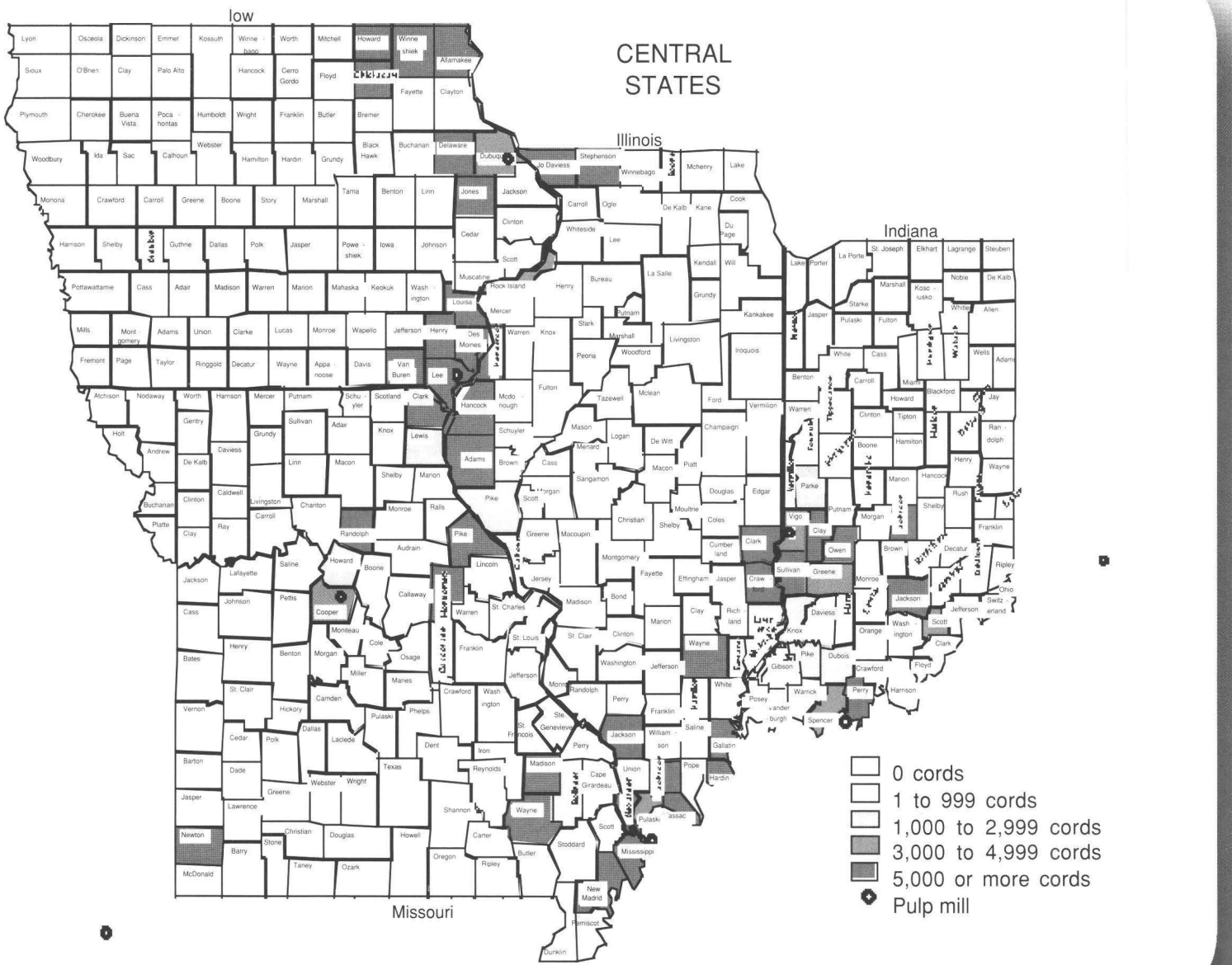

Figure 18.—*Production of pulpwood from roundwood (including chips from roundwood) in the Central States by county, in standard cords, 1999. Locations of Central States mills and nearby pulp mills using Central States pulpwood are shown.*

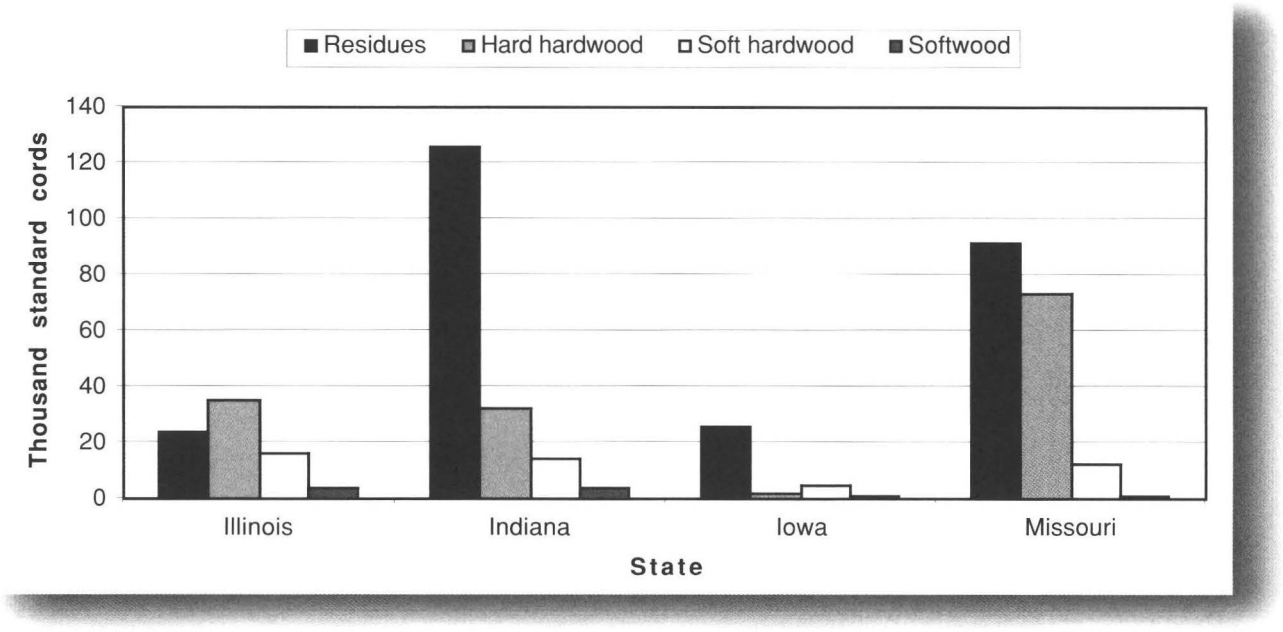

Figure 19.—*Central States pulpwood production by species group and residues, 1999.*

PLAINS STATES

PRODUCTION

- Pulpwood production in the Plains States was 146 thousand cords in 1999, an increase of 26 percent from 1998 (fig. 20). Pulpwood came from Kansas, North Dakota, and South Dakota.
- Softwood residues accounted for 91 percent of the pulpwood production for the Plains States in 1999 (fig. 21), most of which came from South Dakota.
- Eighty-five thousand cords of softwood residue from the Plains States were exported to Wisconsin in 1999.
- One thousand cords of aspen and balsam poplar roundwood from North Dakota were exported to Minnesota in 1999.
- The only mill in the Plains States in 1999 was Merillat Industries, Inc. (particleboard), in Rapid City, SD, which has an annual production capacity of 95 million square feet 3/4-inch basis.

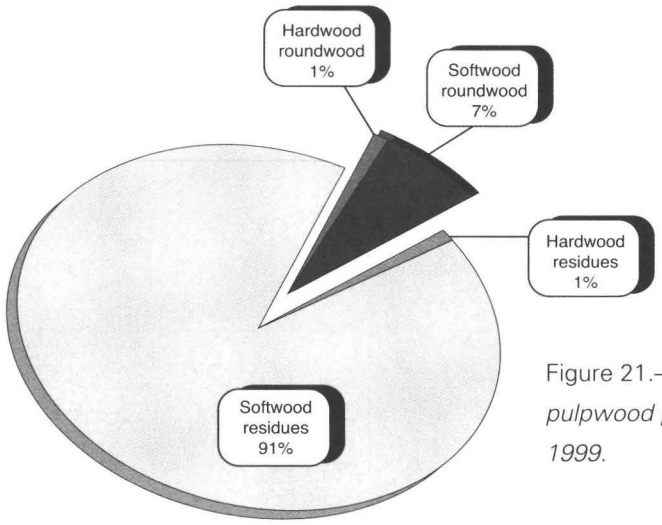

Figure 21.—*Plains States pulpwood production, 1999.*

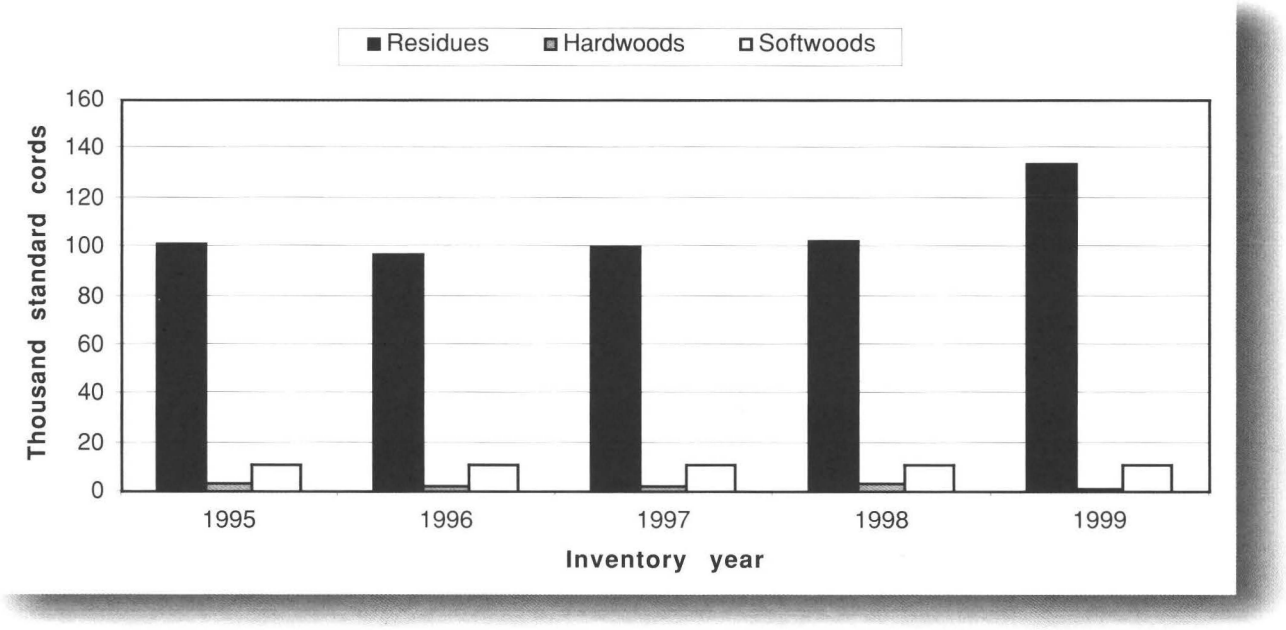

Figure 20.—*Pulpwood production in the Plains States, 1995-1999.*

APPENDIX

Conversion Factors Used In The North-Central Region

Standard cords of green roundwood per green ton:

Species	Factor	Species	Factor
Softwoods	0.4688	White birch	0.4018
Northern white-cedar	.6329	Yellow birch	.3723
Balsam fir	.4688	River birch	.3871
Hemlock	.4150	Sweetgum	.3669
Jack pine	.4688	Yellow-poplar	.4219
Red pine	.4688	Blackgum	.3779
White pine	.4777	Sycamore	.4083
Shortleaf pine	.3956	Cottonwood	.4291
Spruce	.5014	Elm	.4018
Tamarack	.4291	Hickory	.3701
Hardwoods	.3939	Hard maple	.3617
Soft hardwoods	.4171	Soft maple	.4083
Hard hardwoods	.3708	Black cherry	.4688
Ash	.4330	Red oak	.3444
Aspen	.4291	White oak	.3723
Balsam poplar	.4083	Black oak	.3444
Basswood	.5167	Other hardwoods	.4777
Beech	.3956		

TABLE TITLES

Table 1.—*Production and imports of pulpwood, Lake States, 1999*

Table 2.—*Lake States pulpwood production by State of origin, year, and destination, 1995-1999*

Table 3.—*Lake States pulpwood production by State of origin, product form, Forest Survey Unit, and destination, 1999*

Table 4.—*Lake States annual pulpwood production from roundwood by State, Forest Survey Unit, and species group, 1995-1999*

Table 5.—*Pulpwood production from roundwood by Forest Survey Unit, county, and species group, Michigan, 1999*

Table 6.—*Pulpwood production from roundwood by Forest Survey Unit, county, and species group, Minnesota, 1999*

Table 7.—*Pulpwood production from roundwood by Forest Survey Unit, county, and species group, Wisconsin, 1999*

Table 8.—*Number of industrial pulp or particleboard plants in the Lake States by product form, species group used, and State, 1999*

Table 9.—*Average daily production of active wood pulp mills in the Lake States by State, company, location, and type of pulp produced, 1999*

Table 10.—*Annual production of active particleboard and panel mills in the Lake States by State, company, location, and product produced, 1999*

Table 11.—*Production and imports of pulpwood, Central States, 1999*

Table 12.—*Central States pulpwood production by product form and species group, 1995-1999*

Table 13.—*Central States pulpwood production by State and destination, 1995-1999*

Table 14.—*Average daily production of active wood pulp mills in the Central States by company, location, and type of pulp produced, 1999*

Table 1.--Production and imports of pulpwood, Lake States, 1999

(In standard cords, unpeeled)

Product form, species group, and destination	Production by State[1]			Regional total	Imports				Total imports	Total receipts
	Michigan	Minnesota	Wisconsin		Central States	Plains States	Other U.S [2]	Canada		
Softwood roundwood										
Northern white-cedar										
Michigan	5,564	–	463	6,028	–	–	–	6	6	6,033
Total	5,564	–	463	6,028	–	–	–	6	6	6,033
Balsam fir										
Canada	10,080	–	30	10,110	–	–	–	–	–	–
Michigan	42,335	–	3,411	45,745	–	–	–	40	40	45,785
Minnesota	4,464	193,286	18,525	216,275	–	–	–	–	–	216,275
Wisconsin	16,585	587	69,727	86,899	–	–	–	–	–	86,899
Total	73,464	193,873	91,693	359,030	–	–	–	40	40	348,959
Hemlock										
Michigan	69,186	–	8,155	77,341	–	–	–	25	25	77,366
Wisconsin	2,270	–	17,243	19,513	–	–	–	–	–	19,513
Total	71,456	–	25,398	96,854	–	–	–	25	25	96,879
Jack pine										
Michigan	178,713	–	8,426	187,139	–	–	–	323	323	187,463
Minnesota	–	30,415	498	30,913	–	–	–	11,114	11,114	42,027
Wisconsin	25,954	9,924	295,447	331,325	–	–	–	–	–	331,325
Total	204,667	40,339	304,372	549,378	–	–	–	11,437	11,437	560,815
Red pine										
Michigan	67,816	–	3,299	71,115	–	–	–	289	289	71,404
Minnesota	–	34,503	656	35,159	–	–	–	–	–	35,159
Wisconsin	11,211	8,602	269,369	289,183	823	–	–	–	823	290,006
Total	79,027	43,106	273,325	395,457	823	–	–	289	1,112	396,569
White pine										
Michigan	5,624	–	376	6,000	–	–	–	4	4	6,004
Minnesota	–	537	698	1,235	–	–	–	–	–	1,235
Wisconsin	1,650	369	55,926	57,944	541	–	–	–	541	58,485
Total	7,274	905	57,000	65,179	541	–	–	4	545	65,724
Spruce										
Canada	11,251	–	92	11,343	–	–	–	–	–	–
Michigan	16,485	–	1,455	17,939	–	–	–	16	16	17,955
Minnesota	313	101,682	5,818	107,813	–	–	–	–	–	107,813
Wisconsin	21,534	47,077	43,067	111,677	79	–	–	–	79	111,756
Total	49,582	148,758	50,432	248,772	79	–	–	16	95	237,524

Tamarack										
Michigan	2,643	–	250	2,893	–	–	–	3	3	2,896
Minnesota	–	2,655	–	2,655	–	–	–	–	–	2,655
Wisconsin	2,008	9,824	12,926	24,758	–	–	–	–	–	24,758
Total	4,650	12,480	13,176	30,306	–	–	–	3	3	30,309
Total softwood roundwood										
Canada	21,331	–	122	21,453	–	–	–	–	–	–
Michigan	388,365	–	25,835	414,200	–	–	–	706	706	414,906
Minnesota	4,776	363,078	26,196	394,050	–	–	–	11,114	11,114	405,164
Wisconsin	81,212	76,383	763,706	921,301	1,443	–	–	–	1,443	922,743
Total	495,684	439,461	815,858	1,751,004	1,443	–	–	11,820	13,263	1,742,813
Softwood residues										
Canada	29,120	19,137	1,564	49,821	–	–	–	–	–	–
Michigan	99,671	–	10,203	109,874	–	–	–	114	114	109,988
Minnesota	–	60,144	1,258	61,402	–	–	–	–	–	61,402
Wisconsin	125,533	–	104,981	230,514	–	85,000	23,000	12,518	120,518	351,032
Total	254,325	79,281	118,005	451,611	–	85,000	23,000	12,632	120,632	522,422
Total softwood material										
Canada	50,451	19,137	1,686	71,274	–	–	–	–	–	–
Michigan	488,036	–	36,038	524,074	–	–	–	820	820	524,894
Minnesota	4,776	423,222	27,454	455,452	–	–	–	11,114	11,114	466,565
Wisconsin	206,745	76,383	868,686	1,151,815	1,443	85,000	23,000	12,518	121,961	1,273,776
Total	750,009	518,741	933,864	2,202,614	1,443	85,000	23,000	24,452	133,895	2,265,235

(Table 1 continued on next page)

(Table 1 continued)

Product form, species group, and destination	Production by State[1]			Regional total	Imports				Total imports	Total receipts
	Michigan	Minnesota	Wisconsin		Central States	Plains States	Other U.S [2]	Canada		
Hardwood roundwood										
Ash										
Michigan	41,128	–	2,276	43,404	–	–	–	3	3	43,407
Minnesota	–	273	–	273	–	–	–	–	–	273
Wisconsin	2,164	607	66,556	69,326	–	–	–	–	–	69,326
Total	43,291	880	68,832	113,003	–	–	–	3	3	113,006
Aspen										
Michigan	781,831	–	43,868	825,700	–	–	–	35,423	35,423	861,123
Minnesota	–	2,148,518	24,038	2,172,555	–	1,178	–	68,175	69,353	2,241,908
Wisconsin	50,103	92,432	978,926	1,121,460	–	–	–	10,139	10,139	1,131,599
Total	831,934	2,240,949	1,046,832	4,119,715	–	1,178	–	113,737	114,915	4,234,631
Balsam poplar										
Michigan	56,566	–	4,859	61,425	–	–	–	11	11	61,436
Minnesota	–	104,189	48	104,237	–	31	–	5,179	5,210	109,447
Wisconsin	25	–	506	531	–	–	–	–	–	531
Total	56,591	104,189	5,413	166,194	–	31	–	5,190	5,221	171,414
Basswood										
Michigan	64,022	–	6,660	70,682	–	–	–	4	4	70,686
Minnesota	–	4,256	–	4,256	–	–	–	–	–	4,256
Wisconsin	2,173	2,072	52,187	56,432	–	–	–	–	–	56,432
Total	66,195	6,328	58,847	131,370	–	–	–	4	4	131,375
Beech										
Michigan	36,694	–	4,273	40,967	–	–	–	6	6	40,972
Wisconsin	3	–	818	821	–	–	–	–	–	821
Total	36,697	–	5,091	41,788	–	–	–	6	6	41,793
White birch										
Michigan	70,073	–	5,979	76,052	–	–	–	44	44	76,096
Minnesota	–	113,881	4,559	118,440	–	–	–	32	32	118,472
Wisconsin	7,555	30,184	206,432	244,171	–	–	–	3,649	3,649	247,820
Total	77,628	144,065	216,971	438,663	–	–	–	3,725	3,725	442,388
Yellow birch										
Michigan	43,423	–	5,443	48,866	–	–	–	17	17	48,883
Wisconsin	846	–	24,871	25,717	–	–	–	–	–	25,717
Total	44,269	–	30,314	74,583	–	–	–	17	17	74,601
Cottonwood										
Michigan	368	–	–	368	–	–	–	–	–	368
Wisconsin	25	–	2,472	2,497	–	–	–	–	–	2,497
Total	393	–	2,472	2,865	–	–	–	–	–	2,865

Elm										
Michigan	1,840	–	28	1,868	–	–	–	1	1	1,869
Wisconsin	655	–	39,070	39,725	–	–	–	–	–	39,725
Total	2,495	–	39,098	41,593	–	–	–	1	1	41,594
Hickory										
Michigan	729	–	–	729	–	–	–	–	–	729
Wisconsin	65	–	1,450	1,515	–	–	–	–	–	1,515
Total	794	–	1,450	2,244	–	–	–	–	–	2,244
Hard maple										
Michigan	410,118	–	40,399	450,517	–	–	–	205	205	450,721
Minnesota	–	6,090	3,843	9,933	–	–	–	–	–	9,933
Wisconsin	6,615	734	197,195	204,544	–	–	–	–	–	204,544
Total	416,733	6,824	241,438	664,994	–	–	–	205	205	665,199
Soft maple										
Michigan	446,067	–	40,260	486,327	–	–	–	154	154	486,481
Minnesota	–	2,883	–	2,883	–	–	–	–	–	2,883
Wisconsin	4,653	5,743	169,294	179,690	–	–	–	–	–	179,690
Total	450,720	8,626	209,554	668,901	–	–	–	154	154	669,055
Red oak										
Michigan	47,372	–	751	48,123	–	–	–	1	1	48,124
Wisconsin	1,607	2	135,652	137,262	–	–	–	–	–	137,262
Total	48,980	2	136,403	185,385	–	–	–	1	1	185,386
White oak										
Michigan	38,193	–	–	38,193	–	–	–	–	–	38,193
Wisconsin	65	–	14,993	15,057	–	–	–	–	–	15,057
Total	38,258	–	14,993	53,250	–	–	–	–	–	53,250
Other hardwoods										
Michigan	20,707	–	3,165	23,872	–	–	–	5	5	23,877
Wisconsin	154	–	3,399	3,553	–	–	–	–	–	3,553
Total	20,861	–	6,564	27,425	–	–	–	5	5	27,430

(Table 1 continued on next page)

(Table 1 continued)

Product form, species group, and destination	Production by State[1]			Regional total	Imports				Total imports	Total receipts
	Michigan	Minnesota	Wisconsin		Central States	Plains States	Other U.S [2]	Canada		
Total hardwood roundwood										
Michigan	2,059,133	–	157,959	2,217,092	–	–	–	35,873	35,873	2,252,965
Minnesota	–	2,380,091	32,489	2,412,579	–	1,209	–	73,386	74,595	2,487,174
Wisconsin	76,706	131,773	1,893,823	2,102,303	–	–	–	13,788	13,788	2,116,090
Total	2,135,839	2,511,864	2,084,271	6,731,974	–	1,209	–	123,047	124,256	6,856,230
Hardwood residues										
Canada	–	19,427	–	19,427	–	–	–	–	–	–
Michigan	206,257	–	12,249	218,506	14,064	–	–	1,576	15,640	234,146
Minnesota	–	47,338	2,562	49,900	–	–	–	25,654	25,654	75,555
Other[3]	–	–	1,492	1,492	–	–	–	–	–	–
Wisconsin	22,489	7,456	301,561	331,505	3,465	–	–	–	3,465	334,970
Total	228,746	74,221	317,863	620,830	17,529	–	–	27,231	44,760	644,671
Total hardwood material										
Canada	–	19,427	–	19,427	–	–	–	–	–	–
Michigan	2,265,390	–	170,208	2,435,598	14,064	–	–	37,450	51,514	2,487,111
Minnesota	–	2,427,429	35,051	2,462,480	–	1,209	–	99,040	100,249	2,562,729
Other[3]	–	–	1,492	1,492	–	–	–	–	–	–
Wisconsin	99,195	139,229	2,195,384	2,433,808	3,465	–	–	13,788	17,253	2,451,060
Total	2,364,585	2,586,085	2,402,134	7,352,804	17,529	1,209	–	150,278	169,016	7,500,900
Total all roundwood										
Canada	21,331	–	122	21,453	–	–	–	–	–	–
Michigan	2,447,498	–	183,794	2,631,292	–	–	–	36,579	36,579	2,667,871
Minnesota	4,776	2,743,168	58,684	2,806,629	–	1,209	–	84,500	85,709	2,892,338
Wisconsin	157,918	208,156	2,657,529	3,023,603	1,443	–	–	13,788	15,231	3,038,834
Total	2,631,523	2,951,325	2,900,129	8,482,977	1,443	1,209	–	134,867	137,519	8,599,043
Total all residues										
Canada	29,120	38,564	1,564	69,248	–	–	–	–	–	–
Michigan	305,928	–	22,452	328,380	14,064	–	–	1,690	15,754	344,134
Minnesota	–	107,482	3,820	111,302	–	–	–	25,654	25,654	136,957
Other[3]	–	–	1,492	1,492	–	–	–	–	–	–
Wisconsin	148,022	7,456	406,541	562,019	3,465	85,000	23,000	12,518	123,983	686,002
Total	483,070	153,502	435,869	1,072,441	17,529	85,000	23,000	39,863	165,392	1,167,093
Total all wood material										
Canada	50,451	38,564	1,686	90,701	–	–	–	–	–	–
Michigan	2,753,426	–	206,246	2,959,672	14,064	–	–	38,270	52,334	3,012,005
Minnesota	4,776	2,850,651	62,504	2,917,931	–	1,209	–	110,154	111,363	3,029,294
Other[3]	–	–	1,492	1,492	–	–	–	–	–	–
Wisconsin	305,940	215,612	3,064,070	3,585,622	4,908	85,000	23,000	26,306	139,214	3,724,836
Total	3,114,594	3,104,827	3,335,998	9,555,418	18,972	86,209	23,000	174,730	302,910	9,766,136

[1] Vertical columns of figures under the box heading "Production by State" present the amount of roundwood cut or residue generated in each State.

[2] Mostly Western States.

[3] Pulpwood shipped to mills outside of region.

Table may not add due to rounding.

Table 2.--Lake States pulpwood production by State of origin, year, and destination, 1995-1999[1]

(In thousand standard cords, unpeeled)

MICHIGAN

Year	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other[2]
1995	3,112	2,733	18	346	16
1996	3,111	2,815	5	267	25
1997	3,346	3,104	1	223	18
1998	3,076	2,773	1	272	30
1999	3,115	2,753	5	306	50
5-year average	3,152	2,836	6	283	28

MINNESOTA

Year	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other[2]
1995	2,971	4	2,738	178	50
1996	3,065	–	2,676	352	38
1997	2,980	–	2,654	287	39
1998	2,975	–	2,685	251	39
1999	3,105	–	2,851	216	39
5-year average	3,019	1	2,721	257	41

WISCONSIN

Year	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other[2]
1995	3,482	231	80	3,168	2
1996	3,309	218	68	3,020	3
1997	3,194	234	45	2,913	2
1998	3,160	204	50	2,905	2
1999	3,336	206	63	3,064	3
5-year average	3,296	219	61	3,014	2

[1] Includes mill residues used for pulp.

[2] Includes Canada.

Table may not add due to rounding.

Table 3.--Lake States pulpwood production by State of origin, product form, Forest Survey Unit, and destination, 1999

(In thousand standard cords, unpeeled)

MICHIGAN

Product form and Forest Survey Unit	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other[1]
Roundwood					
Eastern Upper Peninsula	627	574	–	37	16
Western Upper Peninsula	1,120	996	5	118	2
Northern Lower Peninsula	797	790	–	3	4
Southern Lower Peninsula	87	87	–	*	–
Total	2,632	2,447	5	158	21
Residues	483	306	–	148	29
Total pulpwood	3,115	2,753	5	306	50

MINNESOTA

Product form and Forest Survey Unit	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other[1]
Roundwood					
Aspen-Birch	1,171	–	1,074	97	–
Northern Pine	1,449	–	1,248	21	–
Central Hardwood	237	–	342	74	–
Prairie	94	–	78	16	–
Total	2,951	–	2,743	208	–
Residues	154	–	107	7	39
Total pulpwood	3,105	–	2,851	216	39

WISCONSIN

Product form and Forest Survey Unit	Total production	Destination of pulpwood			
		Michigan	Minnesota	Wisconsin	Other[1]
Roundwood					
Northeastern	899	153	3	743	*
Northwestern	1,209	30	55	1,124	–
Central	695	1	1	693	–
Southwestern	79	–	*	79	–
Southeastern	18	*	–	18	–
Total	2,900	184	59	2,658	*
Residues	436	22	4	407	3
Total pulpwood	3,336	206	63	3,064	3

* Less than 500 standard cords, unpeeled.

[1] Includes Canada.

Table may not add due to rounding.

Table 4.--Lake States annual pulpwood production from roundwood by State, Forest Survey Unit, and species group, 1995-1999

(In thousand standard cords, unpeeled)

Forest Survey Unit	All species					Pine					Spruce				
	1995	1996	1997	1998	1999	1995	1996	1997	1998	1999	1995	1996	1997	1998	1999
MICHIGAN															
Eastern Upper Peninsula	774	689	633	590	627	147	126	131	106	110	27	27	18	25	24
Western Upper Peninsula	1,149	1,217	1,193	1,131	1,120	99	106	97	75	72	39	50	27	31	23
Northern Lower Peninsula	845	861	1,178	852	797	108	141	163	120	108	1	1	1	1	2
Southern Lower Peninsula	66	67	95	89	87	*	*	2	1	1	–	*	–	*	*
Total	2,834	2,834	3,099	2,662	2,632	355	373	392	302	291	66	78	46	57	50
MINNESOTA															
Aspen-Birch	1,263	1,321	1,046	1,119	1,171	40	38	35	33	27	118	158	123	110	102
Northern Pine	1,263	1,232	1,501	1,357	1,449	65	51	66	43	46	31	44	43	41	45
Central Hardwood	242	296	277	253	237	17	29	26	20	12	1	3	3	4	1
Prairie	43	48	52	72	94	–	–	–	*	*	–	*	–	*	*
Total	2,810	2,897	2,875	2,800	2,951	122	119	126	97	84	150	204	168	156	149
WISCONSIN															
Northeast	1,020	1,003	980	874	899	132	158	173	149	117	16	16	18	18	21
Northwest	1,334	1,210	1,134	1,119	1,209	228	231	205	151	164	19	18	22	16	21
Central	661	618	577	652	695	285	264	270	278	290	3	1	2	3	5
Southwest	65	75	80	87	79	33	39	39	51	51	2	1	1	2	2
Southeast	35	40	40	33	18	17	20	23	19	13	1	1	1	2	1
Total	3,115	2,945	2,811	2,765	2,900	695	712	709	649	635	40	34	44	40	50
Total Lake States	8,759	8,676	8,785	8,227	8,483	1,172	1,203	1,228	1,048	1,009	256	318	259	253	249

(Table 4 continued on next page)

(Table 4 continued)

Forest Survey Unit	Balsam fir					Other softwoods					Aspen				
	1995	1996	1997	1998	1999	1995	1996	1997	1998	1999	1995	1996	1997	1998	1999
MICHIGAN															
Eastern Upper Peninsula	34	25	20	28	31	30	32	24	22	25	192	152	125	148	165
Western Upper Peninsula	43	38	29	41	37	46	53	57	55	57	368	334	339	309	287
Northern Lower Peninsula	2	2	2	3	5	*	*	*	*	1	429	406	540	375	354
Southern Lower Peninsula	–	*	–	–	*	–	*	–	*	*	13	22	38	25	26
Total	79	65	52	72	73	76	85	82	77	82	1,003	913	1,041	857	832
MINNESOTA															
Aspen-Birch	119	171	106	101	108	11	11	12	9	10	831	816	649	736	804
Northern Pine	76	75	79	80	85	2	2	8	6	3	1,021	988	1,187	1,057	1,142
Central Hardwood	2	6	10	6	1	*	–	1	1	*	209	247	222	206	204
Prairie	–	*	–	*	*	*	–	–	*	*	43	47	50	68	91
Total	198	252	195	188	194	12	13	21	16	12	2,103	2,098	2,108	2,067	2,241
WISCONSIN															
Northeast	30	41	32	36	40	27	26	24	22	24	397	367	328	313	300
Northwest	41	50	44	42	50	7	7	8	10	13	614	539	481	469	529
Central	1	1	1	1	1	2	2	3	2	2	179	170	149	171	203
Southwest	*	*	*	*	*	*	*	*	*	*	17	24	17	18	14
Southeast	1	*	*	*	*	*	*	*	*	*	8	11	5	4	1
Total	73	92	78	79	92	37	36	34	34	39	1,214	1,109	980	975	1,047
Total Lake States	350	410	324	339	359	125	135	138	127	133	4,320	4,121	4,130	3,899	4,120

(Table 4 continued on next page)

(Table 4 continued)

Forest Survey Unit	Birch					Maple					Other hardwoods				
	1995	1996	1997	1998	1999	1995	1996	1997	1998	1999	1995	1996	1997	1998	1999
MICHIGAN															
Eastern Upper Peninsula	51	77	51	37	27	237	203	221	183	209	57	48	42	41	36
Western Upper Peninsula	84	144	87	71	63	375	370	430	414	460	94	122	126	136	121
Northern Lower Peninsula	42	35	40	33	30	156	188	266	172	170	106	88	165	148	127
Southern Lower Peninsula	*	*	1	*	1	11	16	23	23	28	42	28	32	38	31
Total	177	256	180	141	122	779	777	940	792	867	299	287	365	362	315
MINNESOTA															
Aspen-Birch	65	58	60	60	61	9	5	9	11	8	70	65	51	58	52
Northern Pine	38	45	55	69	74	4	1	1	1	1	27	26	63	59	53
Central Hardwood	8	7	8	6	8	4	4	5	7	6	*	1	3	3	4
Prairie	*	*	*	*	*	–	–	–	–	1	1	*	2	4	2
Total	111	109	123	135	144	17	9	15	19	15	97	92	119	123	111
WISCONSIN															
Northeast	123	120	106	85	89	194	152	178	158	188	101	124	122	93	120
Northwest	152	123	119	131	128	172	158	165	195	194	101	83	89	105	110
Central	28	27	24	28	27	59	64	51	65	64	104	90	77	105	102
Southwest	3	3	5	3	2	5	4	7	5	3	6	5	11	7	6
Southeast	2	1	2	1	1	3	2	4	2	1	3	3	4	4	2
Total	309	275	257	248	247	433	379	405	426	451	315	306	304	314	339
Total Lake States	596	641	559	524	513	1,229	1,165	1,360	1,237	1,334	711	684	788	799	765

* Less than 500 standard cords.

Table may not add due to rounding.

Table 5.--Pulpwood production from roundwood by Forest Survey Unit, county, and species group, Michigan, 1999

(In standard cords, unpeeled)

Forest Survey Unit and county[1]	All species	Species group										
		Northern white-cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar
Eastern Upper Peninsula												
Alger	79,652	277	2,759	2,868	5,728	2,402	291	1,141	221	1,048	8,084	460
Chippewa	111,268	581	7,011	1,647	8,164	7,137	303	4,927	156	401	52,494	558
Delta	123,286	652	9,206	4,403	14,605	9,457	691	6,492	1,277	528	29,931	1,701
Luce	58,671	91	1,043	4,963	7,309	6,321	74	1,455	49	623	1,854	398
Mackinac	101,601	252	5,047	1,492	11,256	3,602	179	4,755	119	477	42,884	533
Menominee	70,954	298	3,171	2,304	3,885	2,232	396	3,088	342	579	19,687	1,458
Schoolcraft	81,694	385	3,097	1,972	13,941	11,673	312	1,989	208	557	10,025	506
Total	627,127	2,536	31,333	19,649	64,889	42,824	2,246	23,846	2,372	4,212	164,958	5,613
Western Upper Peninsula												
Baraga	108,922	132	1,186	11,251	12,030	3,161	235	859	71	2,003	23,261	1,685
Dickinson	99,209	351	6,171	2,098	4,555	1,608	502	3,973	658	494	46,967	4,434
Gogebic	96,272	–	1,589	8,373	2,039	834	60	1,182	22	2,146	15,206	1,171
Houghton	168,444	318	4,525	3,600	4,717	1,095	284	3,106	196	4,483	36,630	3,426
Iron	187,619	727	11,508	4,751	11,279	6,184	929	7,089	664	1,818	44,867	4,428
Keweenaw	53,953	28	208	1,948	233	55	23	82	15	956	5,848	622
Marquette	246,458	1,059	9,317	17,456	14,354	5,725	985	5,241	611	1,828	55,282	4,638
Ontonagon	159,473	59	2,133	2,119	681	282	216	1,847	32	5,315	59,284	3,697
Total	1,120,350	2,675	36,637	51,596	49,888	18,945	3,234	23,378	2,269	19,045	287,346	24,100
Northern Lower Peninsula												
Alcona	41,953	–	17	–	5,143	338	45	–	–	102	23,895	3,747
Alpena	22,957	39	605	–	686	52	3	153	–	221	13,329	3,060
Antrim	10,836	–	–	–	1,413	333	13	–	–	371	2,968	72
Arenac	7,858	–	–	–	160	131	–	–	–	24	5,233	103
Bay	1,356	–	–	–	118	55	–	–	–	3	1,054	16
Benzie	11,417	–	–	39	725	455	136	20	–	861	2,887	78
Charlevoix	8,786	–	–	–	38	198	–	–	–	104	2,815	415
Cheboygan	63,960	58	1,013	–	11,503	721	90	566	–	264	36,998	3,556
Clare	33,717	–	–	–	1,957	124	6	–	–	1,949	17,225	155
Crawford	33,922	–	–	–	13,108	174	96	–	–	87	11,831	68
Emmet	29,163	62	549	–	380	186	3	161	–	61	20,077	4
Gladwin	28,304	–	–	–	101	379	–	–	–	279	16,554	682
Grand Traverse	13,031	–	–	–	3,255	1,049	–	–	–	246	4,603	24
Iosco	15,502	–	35	–	6,368	477	58	–	–	14	4,170	309
Isabella	14,914	–	–	–	377	356	–	–	–	220	7,376	520
Kalkaska	31,697	16	121	173	7,705	1,993	749	48	9	337	9,205	436
Lake	26,005	–	–	–	1,810	1,380	–	–	–	1,848	7,346	291
Leelanau	914	–	–	–	–	–	–	–	–	122	188	1

Manistee	18,857	–	–	–	371	1,071	–	–	–	2,106	4,198	37
Mason	24,957	–	–	–	134	83	–	–	–	1,751	7,372	628
Mecosta	14,788	–	–	–	304	197	–	–	–	243	7,415	377
Midland	20,646	–	–	–	57	27	–	–	–	300	10,502	608
Missaukee	34,835	–	–	–	1,967	1,551	302	–	–	207	18,581	231
Montmorency	31,399	23	592	–	3,877	109	14	377	–	79	17,023	–
Newaygo	25,456	–	–	–	257	68	–	–	–	1,124	7,581	544
Oceana	9,399	–	–	–	–	–	–	–	–	347	2,640	289
Ogemaw	24,821	–	–	–	1,074	132	–	–	–	2,144	8,854	477
Osceola	19,166	–	–	–	66	91	–	–	–	984	8,408	320
Oscoda	45,921	–	64	–	10,164	1,615	69	52	–	549	20,032	2,389
Otsego	51,621	41	497	–	6,070	1,136	121	161	–	617	18,154	424
Presque Isle	30,777	62	1,564	–	2,261	259	1	720	–	217	16,095	2,768
Roscommon	25,845	49	397	–	5,554	335	30	95	–	418	11,856	97
Wexford	21,901	–	–	–	2,309	2,030	6	–	–	894	7,083	367
Total	796,682	351	5,455	211	89,313	17,105	1,744	2,353	9	19,094	353,547	23,092
Southern Lower Peninsula												
Allegan	12,519	–	–	–	–	–	–	–	–	20	1,628	48
Barry	335	–	–	–	–	–	–	–	–	2	54	4
Berrien	155	–	–	–	–	–	–	–	–	–	18	–
Branch	174	–	–	–	–	–	–	–	–	–	20	–
Calhoun	1,069	–	–	–	–	–	–	–	–	–	121	–
Gratiot	339	–	–	–	–	–	–	–	–	45	44	–
Huron	929	–	–	–	12	–	–	–	–	5	760	13
Ionia	228	–	–	–	–	–	–	–	–	3	57	8
Kalamazoo	4,492	–	16	–	–	–	–	–	–	–	505	–
Kent	13,802	–	–	–	14	–	–	–	–	212	4,091	501
Lapeer	122	3	18	–	23	–	–	5	–	1	26	–
Lenawee	165	–	–	–	–	67	–	–	–	–	–	–
Livingston	29	–	–	–	–	–	–	–	–	–	11	2
Macomb	26	–	–	–	–	–	–	–	–	–	9	1
Montcalm	22,779	–	4	–	502	65	–	–	–	456	9,727	2,769
Muskegon	15,856	–	–	–	26	–	–	–	–	119	2,958	276
Oakland	85	–	–	–	–	–	49	–	–	–	4	–
Ottawa	3,108	–	–	–	–	–	–	–	–	54	989	126
Saginaw	120	–	–	–	–	–	–	–	–	–	89	–
Sanilac	2,319	–	–	–	–	21	–	–	–	6	1,750	13
Shiawassee	425	–	–	–	–	–	–	–	–	9	156	21
St Joseph	1,936	–	–	–	–	–	–	–	–	–	218	–
Tuscola	873	–	–	–	–	–	–	–	–	–	873	–
Van Buren	3,325	–	–	–	–	–	–	–	–	–	375	–
Wayne	2,156	–	–	–	–	–	–	–	–	7	1,600	5
Total	87,365	3	38	–	577	153	49	5	–	941	26,083	3,787
State total	2,631,523	5,564	73,464	71,456	204,667	79,027	7,274	49,582	4,650	43,291	831,934	56,591

(Table 5 continued on next page)

(Table 5 continued)

Forest Survey Unit and county[1]	Species group											
	Basswood	Beech	White birch	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwoods
Eastern Upper Peninsula												
Alger	1,936	2,349	1,260	2,945	–	20	–	21,830	21,903	403	–	1,725
Chippewa	853	830	3,160	978	–	15	–	9,393	11,825	111	227	499
Delta	1,429	1,106	3,414	1,978	–	48	–	19,057	16,274	177	–	862
Luce	1,082	1,374	962	1,765	–	15	–	13,744	14,316	232	–	1,003
Mackinac	878	1,018	2,404	1,390	–	20	–	11,948	12,460	163	–	724
Menominee	1,415	1,173	1,733	1,668	1	31	–	13,465	12,912	208	–	911
Schoolcraft	928	1,166	2,027	1,800	–	38	–	15,809	14,187	193	–	879
Total	8,520	9,015	14,960	12,524	1	187	–	105,247	103,878	1,487	227	6,602
Western Upper Peninsula												
Baraga	3,321	1,659	3,171	2,710	1	39	–	22,079	18,405	427	–	1,235
Dickinson	3,196	891	3,111	1,153	1	115	1	8,839	9,231	166	1	692
Gogebic	3,050	2,740	3,168	3,476	2	231	29	23,536	24,358	1,213	29	1,817
Houghton	7,044	3,194	3,645	5,563	–	61	–	46,257	37,008	908	–	2,382
Iron	4,706	3,343	5,615	4,589	–	156	3	36,509	35,307	636	3	2,510
Keweenaw	2,062	2,185	229	2,502	–	2	–	16,861	18,122	379	–	1,591
Marquette	4,563	3,630	10,769	5,937	1	115	–	54,042	47,511	610	–	2,785
Ontonagon	8,952	2,213	3,210	4,477	19	146	31	35,763	26,045	1,674	31	1,246
Total	36,893	19,854	32,918	30,408	24	867	65	243,886	215,987	6,012	65	14,258
Northern Lower Peninsula												
Alcona	484	103	1,753	–	–	–	–	788	3,005	2,531	–	–
Alpena	109	237	1,655	–	–	–	–	1,085	1,685	38	–	–
Antrim	677	98	642	12	–	13	12	1,298	2,249	338	326	–
Arenac	11	24	284	–	–	–	–	95	1,679	38	76	–
Bay	–	3	–	–	–	–	–	11	96	–	–	–
Benzie	537	233	516	14	–	15	29	1,420	1,913	764	776	–
Charlevoix	1,199	74	211	31	–	34	–	2,275	1,392	–	–	–
Cheboygan	579	293	2,079	1	–	–	–	1,820	3,685	237	496	1
Clare	1,020	478	608	28	–	31	68	2,437	3,716	1,882	2,033	–
Crawford	226	110	1,035	10	–	10	–	1,488	2,930	2,739	12	–
Emmet	651	111	1,553	1	–	1	–	1,802	3,561	–	–	–
Gladwin	319	134	638	115	–	124	–	2,299	5,838	280	561	–
Grand Traverse	624	67	183	4	–	5	7	410	1,468	432	652	–
Iosco	8	14	392	–	–	–	–	102	642	2,913	–	–
Isabella	282	101	286	95	328	102	188	1,658	2,952	24	49	–
Kalkaska	448	155	744	79	–	86	4	3,922	4,972	244	251	–
Lake	1,010	468	541	53	–	57	62	2,719	3,634	2,123	2,664	–
Leelanau	62	30	31	–	–	–	5	121	124	114	116	–

Manistee	1,065	506	532	7	–	7	75	2,335	2,476	1,998	2,073	–
Mason	1,060	475	613	115	–	124	53	3,680	5,353	1,627	1,890	–
Mecosta	233	94	186	69	–	74	3	1,537	2,974	521	561	–
Midland	284	110	386	99	–	107	–	1,952	4,126	695	1,395	–
Missaukee	500	84	890	42	–	45	3	1,875	6,050	979	1,528	–
Montmorency	1,636	62	1,858	–	–	–	2	1,310	3,513	841	83	–
Newaygo	722	319	436	99	–	107	32	2,803	5,582	2,532	3,251	–
Oceana	258	108	168	52	–	57	7	1,242	2,533	769	929	–
Ogemaw	1,239	540	867	–	–	–	75	2,405	2,995	2,018	2,002	–
Osceola	627	265	402	58	–	63	31	2,153	3,500	992	1,206	–
Oscoda	1,109	440	2,679	4	–	4	5	2,298	4,025	270	154	–
Otsego	1,561	861	2,986	20	–	22	2	7,688	10,551	343	365	–
Presque Isle	263	230	2,573	–	–	–	–	1,328	2,138	299	–	–
Roscommon	315	129	730	12	–	13	14	792	3,603	849	555	–
Wexford	557	247	347	67	–	72	26	2,121	3,952	832	988	–
Total	19,676	7,202	28,803	1,089	328	1,174	704	61,268	108,912	30,260	24,991	1
Southern Lower Peninsula												
Allegan	24	9	19	9	–	10	–	171	3,932	3,155	3,494	–
Barry	2	1	2	1	–	1	–	14	95	72	89	–
Berrien	–	–	–	–	–	–	–	–	50	42	45	–
Branch	–	–	–	–	–	–	–	–	56	47	51	–
Calhoun	–	–	–	–	–	–	–	–	344	290	314	–
Gratiot	53	41	41	–	–	–	–	37	42	35	–	–
Huron	6	2	5	2	8	2	4	40	70	–	–	–
Ionia	4	2	3	1	5	2	3	25	43	24	48	–
Kalamazoo	–	–	–	–	–	–	–	–	1,441	1,216	1,314	–
Kent	253	97	197	91	–	98	–	1,774	4,269	1,036	1,169	–
Lapeer	2	–	6	–	–	–	–	5	15	18	–	–
Lenawee	–	–	–	–	–	–	–	98	–	–	–	–
Livingston	1	–	–	–	1	–	–	5	8	–	–	–
Macomb	1	–	–	–	1	–	–	4	7	–	–	–
Montcalm	489	377	287	63	–	68	–	2,537	3,750	768	916	–
Muskegon	141	53	108	50	–	54	–	978	4,361	2,928	3,803	–
Oakland	1	1	8	–	–	–	–	4	18	–	–	–
Ottawa	64	25	50	23	–	25	–	447	957	162	187	–
Saginaw	–	–	–	–	–	–	–	–	31	–	–	–
Sanilac	34	2	89	2	8	2	7	42	343	–	–	–
Shiawassee	11	4	8	4	13	4	8	68	119	–	–	–
St Joseph	–	–	–	–	–	–	–	–	623	526	569	–
Tuscola	–	–	–	–	–	–	–	–	–	–	–	–
Van Buren	–	–	–	–	–	–	–	–	1,071	903	976	–
Wayne	21	11	124	1	3	1	2	83	298	–	–	–
Total	1,106	626	947	248	39	268	25	6,331	21,944	11,220	12,975	–
State total	66,195	36,697	77,628	44,269	393	2,495	794	416,733	450,720	48,980	38,258	20,861

[1] Includes only those counties that supplied pulpwood in 1999.

Table may not add due to rounding.

Table 6.--Pulpwood production from roundwood by Forest Survey Unit, county, and species group, Minnesota, 1999

(In standard cords, unpeeled)

Forest Survey Unit and county[1]	All species	Species group													
		Balsam fir	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar	Bass-wood	White birch	Hard maple	Soft maple	Red oak
Aspen-Birch															
Carlton	61,629	7,835	1,120	2,709	118	1,477	75	–	40,838	1,113	11	5,421	513	400	–
Cook	49,107	3,298	1,017	85	8	7,088	1,175	–	34,809	81	7	1,517	–	23	–
Koochiching	396,714	39,168	4,500	254	24	40,692	5,487	–	273,539	27,837	–	5,212	–	–	–
Lake	81,804	7,165	1,190	1,319	146	12,967	302	392	44,787	2,086	623	9,445	–	1,383	–
St. Louis	582,021	50,587	10,045	4,196	210	40,005	2,544	392	409,708	19,431	81	39,375	3,269	2,175	2
Total	1,171,276	108,053	17,872	8,563	506	102,229	9,583	784	803,681	50,548	722	60,970	3,782	3,981	2
Northern Pine															
Aitkin	114,905	3,763	252	1,160	64	1,823	863	–	99,824	1,871	142	4,875	149	119	–
Becker	73,665	791	725	805	–	101	124	–	67,089	1,662	–	2,368	–	–	–
Beltrami	178,335	4,791	1,484	2,383	–	881	45	96	141,599	17,686	1,442	7,660	268	–	–
Cass	206,662	7,359	2,494	5,837	–	2,558	182	–	168,821	3,555	–	15,853	–	–	–
Clearwater	59,501	2,059	216	177	–	79	20	–	52,772	1,365	–	2,812	–	–	–
Crow Wing	93,031	126	2,155	3,679	–	45	–	–	79,796	501	–	6,730	–	–	–
Hubbard	131,541	964	3,149	4,789	–	349	22	–	113,162	539	–	8,566	–	–	–
Itasca	428,605	60,488	4,216	5,065	36	30,813	653	–	287,699	15,080	–	24,452	76	27	–
Lake of the Woods	79,603	3,864	2,061	394	–	7,835	583	–	59,393	5,244	–	227	–	–	–
Mahnomen	19,248	10	94	–	–	25	13	–	18,202	447	–	457	–	–	–
Roseau	45,247	276	818	222	–	742	327	–	39,340	3,300	–	221	–	–	–
Wadena	18,525	120	1,672	1,681	11	74	–	–	14,686	46	–	235	–	–	–
Total	1,448,867	84,613	19,338	26,193	112	45,325	2,834	96	1,142,383	51,296	1,584	74,455	493	146	–
Central Hardwood															
Anoka	570	–	–	160	–	–	–	–	410	–	–	–	–	–	–
Benton	864	–	–	198	8	–	–	–	657	1	–	–	–	–	–
Chisago	707	–	128	219	15	–	–	–	345	–	–	–	–	–	–
Dakota	29	–	–	–	–	–	–	–	14	–	16	–	–	–	–
Douglas	386	–	–	–	–	–	–	–	386	–	–	–	–	–	–
Goodhue	104	–	–	–	–	–	–	–	104	–	–	–	–	–	–
Hennepin	868	–	126	580	26	14	–	–	–	–	–	92	–	30	–
Houston	13	–	–	13	–	–	–	–	–	–	–	–	–	–	–
Isanti	1,352	–	170	873	38	–	–	–	262	–	–	10	–	–	–
Kanabec	23,944	–	128	341	–	174	–	–	20,975	6	904	706	–	711	–
Mille Lacs	29,082	–	–	58	–	376	–	–	25,587	13	1,394	564	–	1,089	–
Morrison	17,772	–	–	49	–	–	–	–	16,568	85	428	304	–	338	–
Otter Tail	24,295	–	49	14	9	–	–	–	24,078	97	–	48	–	–	–
Pine	127,314	1,170	2,310	4,289	55	438	–	–	107,030	196	1,155	6,551	2,286	1,835	–
Sherburne	937	13	–	809	28	88	–	–	–	–	–	–	–	–	–
Todd	7,880	–	39	294	–	–	–	–	7,323	6	–	219	–	–	–
Wabasha	411	–	–	260	69	53	29	–	–	–	–	–	–	–	–
Washington	147	–	–	109	30	–	–	–	8	–	–	–	–	–	–
Winona	135	–	17	83	–	–	–	–	35	–	–	–	–	–	–
Total	236,812	1,182	2,967	8,349	277	1,142	29	–	203,783	403	3,897	8,494	2,286	4,003	–
Prairie															
Clay	116	–	–	–	–	–	–	–	116	–	–	–	–	–	–
Kittson	20,153	19	88	–	–	50	26	–	19,376	593	–	–	–	–	–
Marshall	14,878	5	21	–	–	13	7	–	13,987	834	–	10	–	–	–
Norman	11,400	–	52	–	–	–	–	–	11,341	6	–	1	–	–	–
Pennington	9,576	–	–	–	–	–	–	–	9,550	26	–	–	–	–	–
Polk	26,571	–	–	–	11	–	–	–	25,162	378	125	135	264	497	–
Red Lake	11,676	–	–	–	–	–	–	–	11,571	105	–	–	–	–	–
Total	94,370	24	162	–	11	63	33	–	91,103	1,942	125	146	264	497	–
State total	2,951,325	193,873	40,339	43,106	905	148,758	12,480	880	2,240,949	104,189	6,328	144,065	6,824	8,626	2

[1] Includes only those counties that supplied pulpwood in 1999.

Table may not add due to rounding.

Table 7.--Pulpwood production from roundwood by Forest Survey Unit, county, and species group, Wisconsin, 1999

(In standard cords, unpeeled)

Forest Survey Unit and county[1]	All species	Species group										
		N. white-cedar	Balsam fir	Hemlock	Jack pine	Red pine	White pine	Spruce	Tamarack	Ash	Aspen	Balsam poplar
Northeastern												
Florence	54,472	28	992	5,237	658	1,401	80	1,431	55	835	17,288	674
Forest	104,261	–	6,844	2,025	871	2,904	114	2,710	515	3,339	34,552	1,214
Langlade	114,223	–	8,641	915	2,150	2,839	739	2,816	707	4,567	41,397	248
Lincoln	132,968	–	6,693	1,133	2,564	3,261	1,181	3,215	937	5,886	49,435	129
Marinette	85,287	–	1,687	1,186	11,789	11,685	854	534	506	1,001	30,892	1,432
Menominee	98,549	435	3,306	7,231	8,299	6,674	1,169	1,390	234	2,997	24,318	476
Oconto	40,932	–	1,401	534	1,930	5,326	587	1,392	189	585	16,790	552
Oneida	134,988	–	7,743	492	6,373	9,261	2,386	5,983	938	5,076	40,446	167
Shawano	32,932	–	412	703	434	5,085	166	376	26	843	17,306	4
Vilas	100,303	–	2,315	133	13,887	8,978	3,192	1,100	177	3,341	27,176	198
Total	898,914	463	40,033	19,590	48,954	57,413	10,468	20,946	4,284	28,469	299,598	5,094
Northwestern												
Ashland	102,427	–	6,135	172	8,520	5,120	1,030	3,178	282	2,358	37,068	4
Barron	22,748	–	110	15	142	2,020	368	350	–	466	13,010	–
Bayfield	219,809	–	8,052	327	16,890	9,474	2,231	2,724	558	4,571	99,686	32
Burnett	57,347	–	171	–	16,436	3,637	67	114	286	597	25,818	1
Douglas	170,849	–	12,087	–	32,695	16,368	520	3,644	509	734	71,115	37
Iron	120,716	–	4,127	716	543	1,180	85	4,081	101	4,187	59,377	57
Polk	9,868	–	–	–	3,301	1,885	95	314	–	246	484	–
Price	106,241	–	7,860	1,865	2,329	964	220	2,005	3,272	3,726	40,072	55
Rusk	63,051	–	539	47	128	943	271	325	890	2,138	29,995	9
Sawyer	171,712	–	7,336	125	1,679	2,652	439	2,473	1,069	5,716	75,880	4
Taylor	67,745	–	2,786	981	72	644	115	1,029	1,431	2,648	26,775	15
Washburn	96,292	–	1,131	15	25,603	5,299	245	827	–	758	49,359	–
Total	1,208,805	–	50,335	4,262	108,337	50,187	5,684	21,065	8,400	28,145	528,638	215
Central												
Adams	112,998	–	–	–	33,069	21,492	3,859	32	–	620	39,598	–
Chippewa	37,088	–	275	–	1,484	1,610	473	476	192	1,083	15,812	2
Clark	88,589	–	116	–	3,598	3,589	767	73	–	1,932	48,781	1
Eau Claire	27,859	–	–	16	4,603	3,683	535	93	18	579	8,350	–
Jackson	63,434	–	38	–	13,689	12,316	3,687	379	–	830	14,217	1
Juneau	47,287	–	–	–	20,315	10,565	1,638	6	–	201	3,504	–
Marathon	81,645	–	526	1,213	894	6,324	664	2,541	26	3,586	29,427	77
Marquette	19,937	–	–	–	761	11,326	1,225	28	–	15	5,312	–
Monroe	93,459	–	–	–	43,166	12,267	9,959	17	29	584	5,134	–
Portage	33,261	–	236	126	5,823	11,670	1,766	495	148	615	5,956	5
Waupaca	16,188	–	–	14	326	7,033	650	148	14	526	2,594	1
Waushara	26,507	–	13	–	1,912	18,250	2,727	22	47	132	775	–
Wood	46,652	–	3	59	5,771	5,427	1,138	904	–	554	23,864	1
Total	694,905	–	1,206	1,428	135,413	125,552	29,088	5,214	473	11,257	203,323	89

Southwestern												
Buffalo	3,943	–	–	–	36	363	123	151	–	32	2,893	–
Crawford	696	–	–	–	45	476	110	–	–	1	–	–
Dunn	13,607	–	10	–	716	4,557	788	177	–	356	3,151	–
Grant	4,710	–	11	–	30	3,620	992	–	–	2	20	–
Iowa	1,454	–	–	–	–	1,065	390	–	–	–	–	–
La Crosse	12,780	–	17	–	5,968	3,714	673	294	–	46	364	–
Lafayette	1,882	–	–	–	29	1,284	569	–	–	–	–	–
Pepin	1,271	–	–	–	41	368	34	–	–	14	599	–
Pierce	1,987	–	–	–	–	369	61	63	19	58	685	–
Richland	1,953	–	–	–	5	435	215	46	–	5	460	–
Sauk	12,818	–	46	–	1,144	7,144	1,870	822	–	61	463	–
St Croix	7,144	–	–	–	1,183	2,591	285	267	–	27	2,361	–
Trempealeau	12,892	–	–	–	293	5,392	2,494	258	–	99	2,982	–
Vernon	2,028	–	–	–	9	703	810	80	–	5	333	–
Total	79,165	–	84	–	9,499	32,081	9,414	2,157	19	706	14,311	–
Southeastern												
Brown	936	–	28	–	12	765	10	12	–	–	88	9
Calumet	14	–	–	–	14	–	–	–	–	–	–	–
Columbia	6,419	–	–	–	1,278	3,115	500	85	–	29	277	–
Dane	471	–	–	–	13	208	219	7	–	1	–	–
Dodge	109	–	–	–	–	–	13	91	–	1	–	–
Door	1,843	–	6	118	728	–	–	5	–	78	93	6
Fond Du Lac	122	–	–	–	–	–	–	13	–	5	13	–
Green	476	–	–	–	22	433	21	–	–	–	–	–
Green Lake	403	–	–	–	–	199	14	–	–	–	191	–
Jefferson	920	–	–	–	–	907	–	–	–	–	–	–
Kenosha	578	–	–	–	26	280	–	273	–	–	–	–
Kewaunee	33	–	–	–	–	–	–	–	–	3	11	–
Manitowoc	64	–	–	–	15	16	–	–	–	2	16	–
Outagamie	1,476	–	–	–	–	140	19	25	–	108	203	–
Ozaukee	192	–	–	–	–	36	98	40	–	2	–	–
Rock	47	–	–	–	17	30	–	–	–	–	–	–
Sheboygan	485	–	–	–	–	223	97	146	–	–	20	–
Walworth	994	–	–	–	36	788	160	–	–	1	–	–
Washington	1,484	–	–	–	–	336	747	297	–	8	28	–
Waukesha	1,018	–	–	–	9	573	391	11	–	1	24	–
Winnebago	256	–	–	–	–	41	58	45	–	13	–	–
Total	18,340	–	34	118	2,169	8,091	2,346	1,049	–	254	963	16
State total	2,900,129	463	91,693	25,398	304,372	273,325	57,000	50,432	13,176	68,832	1,046,832	5,413

(Table 7 continued on next page)

(Table 7 continued)

Forest Survey Unit and county[1]	Species group											
	Bass-wood	Beech	White birch	Yellow birch	Cotton-wood	Elm	Hickory	Hard maple	Soft maple	Red oak	White oak	Other hardwoods
Northeastern												
Florence	1,418	987	2,810	1,252	1	178	–	8,753	9,250	380	43	720
Forest	3,622	748	8,997	2,005	24	2,829	3	14,612	13,848	1,672	279	534
Langlade	3,403	39	12,654	1,719	31	2,186	58	13,638	11,597	3,308	420	151
Lincoln	7,320	39	13,825	2,411	111	2,065	324	13,368	8,580	9,180	552	759
Marinette	1,862	730	2,284	1,096	2	203	6	7,753	7,955	1,128	147	556
Menominee	449	421	3,040	1,981	1	3,083	23	16,420	14,893	1,050	348	311
Oconto	911	316	1,264	530	3	236	2	3,799	3,843	436	67	238
Oneida	7,684	12	15,185	2,033	120	1,155	235	12,554	8,377	7,619	553	598
Shawano	251	4	1,275	325	1	210	5	2,500	2,452	460	81	11
Vilas	4,385	44	13,045	1,374	61	889	152	8,463	5,796	4,857	345	394
Total	31,304	3,341	74,380	14,725	356	13,033	809	101,862	86,591	30,090	2,835	4,274
Northwestern												
Ashland	1,331	54	7,640	902	4	2,225	5	8,514	6,782	9,912	1,175	15
Barron	337	1	2,053	166	–	135	15	1,290	1,326	835	79	29
Bayfield	3,587	843	22,133	2,367	22	896	129	19,572	17,957	6,301	566	891
Burnett	431	–	3,591	220	–	185	8	2,101	2,329	1,196	143	17
Douglas	618	1	16,611	233	–	219	7	6,412	8,408	540	75	15
Iron	2,986	442	7,984	2,053	14	3,345	96	13,968	11,107	3,524	282	460
Polk	152	–	1,544	85	–	82	1	790	645	210	31	2
Price	3,960	28	14,390	1,368	55	1,552	129	10,020	7,509	4,224	325	314
Rusk	2,121	16	7,123	663	944	1,613	28	7,653	5,710	1,634	195	66
Sawyer	3,859	47	22,722	1,999	4	3,101	19	19,935	18,705	3,329	579	42
Taylor	1,873	83	8,171	1,091	201	3,165	16	8,093	6,716	1,571	224	46
Washburn	541	–	2,909	180	–	149	8	3,963	4,220	955	113	17
Total	21,796	1,516	116,871	11,328	1,244	16,668	461	102,312	91,414	34,230	3,787	1,911
Central												
Adams	238	–	867	229	–	54	43	1,322	784	9,672	1,034	85
Chippewa	1,269	2	3,869	422	738	685	26	3,877	2,277	2,221	240	54
Clark	1,051	12	6,231	611	118	903	6	6,508	5,455	7,869	955	14
Eau Claire	301	5	2,105	206	–	290	9	1,751	1,417	3,487	391	19
Jackson	330	5	1,708	217	1	278	13	2,650	2,285	9,691	1,073	26
Juneau	59	–	381	28	–	27	–	742	694	8,212	916	–
Marathon	1,064	196	4,409	1,484	8	6,245	6	10,445	10,040	2,171	279	22
Marquette	9	–	14	6	–	–	–	40	39	1,047	115	–
Monroe	144	–	878	124	–	60	18	1,811	1,545	15,943	1,745	35
Portage	407	1	1,025	236	5	122	26	1,538	1,178	1,635	190	57
Waupaca	100	8	481	176	1	276	4	1,584	1,596	467	180	9
Waushara	42	–	176	50	–	11	5	328	269	1,398	339	10
Wood	216	4	1,245	127	1	221	–	1,943	1,764	3,055	354	1
Total	5,230	233	23,391	3,917	872	9,174	156	34,540	29,342	66,867	7,808	333

Southwestern												
Buffalo	17	–	80	13	–	7	1	83	57	77	7	2
Crawford	1	–	3	–	–	–	–	3	3	48	5	–
Dunn	243	1	866	128	–	101	10	985	737	693	68	21
Grant	1	–	6	1	–	1	–	5	4	14	2	–
Iowa	–	–	–	–	–	–	–	–	–	–	–	–
La Crosse	23	–	100	19	–	9	2	113	74	1,228	133	4
Lafayette	–	–	–	–	–	–	–	–	–	–	–	–
Pepin	7	–	120	5	–	4	–	38	28	13	1	–
Pierce	36	–	199	23	–	25	–	188	153	94	14	–
Richland	2	–	13	1	–	1	–	14	11	670	75	–
Sauk	23	–	94	12	–	5	1	196	174	688	74	2
St Croix	14	–	185	8	–	7	–	93	91	27	4	–
Trempealeau	43	–	199	34	–	14	5	240	163	608	58	10
Vernon	2	–	15	1	–	1	–	16	14	34	4	–
Total	412	1	1,879	245	–	176	20	1,973	1,509	4,193	446	40
Southeastern												
Brown	6	–	2	–	–	–	–	2	2	–	–	–
Calumet	–	–	–	–	–	–	–	–	–	–	–	–
Columbia	18	–	63	12	–	5	1	72	49	823	89	2
Dane	1	–	4	–	–	–	–	4	3	9	1	–
Dodge	–	–	2	–	–	–	–	2	1	–	–	–
Door	32	–	173	30	–	17	–	248	234	65	9	–
Fond Du Lac	2	–	14	1	–	1	–	16	13	39	4	–
Green	–	–	–	–	–	–	–	–	–	–	–	–
Green Lake	–	–	–	–	–	–	–	–	–	–	–	–
Jefferson	–	–	–	–	–	–	–	–	–	11	1	–
Kenosha	–	–	–	–	–	–	–	–	–	–	–	–
Kewaunee	–	–	1	1	–	–	–	8	9	–	–	–
Manitowoc	–	–	1	1	–	–	–	7	7	–	–	–
Outagamie	47	–	176	44	–	25	2	314	292	66	11	4
Ozaukee	–	–	1	1	–	–	–	7	7	–	–	–
Rock	–	–	–	–	–	–	–	–	–	–	–	–
Sheboygan	–	–	–	–	–	–	–	–	–	–	–	–
Walworth	–	–	–	–	–	–	–	4	4	–	–	–
Washington	–	–	4	3	–	–	–	23	26	10	1	–
Waukesha	–	–	–	–	–	–	–	3	4	–	–	–
Winnebago	–	–	7	5	–	–	–	41	46	–	–	–
Total	106	–	451	99	–	48	3	751	698	1,023	116	6
State total	58,847	5,091	216,971	30,314	2,472	39,098	1,450	241,438	209,554	136,403	14,993	6,564

[1] Includes only those counties that supplied pulpwood in 1999.

Table may not add due to rounding.

Table 8.--Number of industrial pulp or particleboard plants in the Lake States by product form, species group used, and State, 1999

Product form and species group	Total Lake States	State		
		Michigan	Minnesota	Wisconsin
Roundwood				
Softwoods				
Northern white-cedar	2	2	–	–
Balsam fir	17	4	5	8
Hemlock	6	1	–	5
Jack pine	14	3	6	5
Red pine	14	4	5	5
White pine	9	2	2	5
Spruce	16	3	6	7
Tamarack	5	1	1	3
Total plants using softwoods [1]	23	5	9	9
Hardwoods				
Ash	15	7	1	7
Aspen	37	10	13	14
Balsam poplar	14	6	7	1
Basswood	16	9	2	5
Beech	8	7	–	1
White birch	25	9	8	8
Yellow birch	9	5	–	4
Cottonwood	3	1	–	2
Elm	6	2	–	4
Hickory	3	2	–	1
Hard maple	18	9	1	8
Soft maple	18	10	1	7
Red oak	13	7	–	6
White oak	8	4	–	4
Other hardwoods	4	3	–	1
Total plants using hardwoods [1]	43	11	13	19
Total plants using roundwood [1]	45	12	14	19
Residues				
Softwood	11	2	3	6
Hardwood	19	6	4	9
Total plants using residues [1]	21	6	5	10
Total plants [1]	47	12	14	21

[1] Some plants use more than one species, so numbers in columns are not additive.

Table 9.--Average daily production of active wood pulp mills in the Lake States by State, company, location, and type of pulp produced, 1999

(In tons per 24 hours)

State and company	Location	Average daily production	Type of pulp produced					
			Sulfite	Kraft	Groundwood/ mechanical	Semi-chemical	Thermo-chemical	Thermo mechanical
Michigan								
ABT Co.	Alpena	250	–	–	250	–	–	–
Champion International	Quinnesec	1,200	–	1,200	–	–	–	–
Johnson Controls	Battle Creek	8	–	–	–	–	–	8
Mead Corp.. Paper Division	Escanaba	1,838	–	1,838	–	–	–	–
Menasha Corp.	Otsego	660	–	–	–	660	–	–
Packaging Corp. Of America	Manistee	500	–	–	–	500	–	–
SAPPI / SD Warren	Muskegon	304	–	304	–	–	–	–
Smurfit Stone Container	Ontonagon	520	–	–	–	520	–	–
Total	8 mills	5,280	–	3,342	250	1,680	–	8
Minnesota								
Blandin Paper-Forestry	Grand Rapids	500	–	–	500	–	–	–
Boise Cascade	International Falls	986	–	986	–	–	–	–
Certainteed Corp.	Shakopee	242	–	–	–	–	–	242
Champion International Corp.	Sartell	850	–	–	–	–	–	850
Georgia-Pacific Corp.	Duluth	240	–	–	–	–	–	240
International Bildrite, Inc.	International Falls	100	–	–	100	–	–	–
Potlatch Corp.	Cloquet	510	–	510	–	–	–	–
Stora Enso North America	Proctor	325	–	–	325	–	–	–
Total	8 mills	3,753	–	1,496	925	–	–	1,332
Wisconsin								
Appleton Coated	Combined Locks	79	–	–	–	–	79	–
Fraser Papers Inc	Park Falls	170	170	–	–	–	–	–
Georgia-Pacific Corp.	Nekoosa	390	–	390	–	–	–	–
Georgia-Pacific Corp.	Phillips	75	–	–	75	–	–	–
Georgia-Pacific Corp.	Port Edwards	230	230	–	–	–	–	–
Georgia-Pacific Corp.	Superior	232	–	–	232	–	–	–
Globe Building Materials	Cornell	230	–	–	230	–	–	–
International Paper Co.	Kaukauna	392	–	392	–	–	–	–
Packaging Corp. Of America	Tomahawk	1,378	–	–	–	1,378	–	–
Stora Enso North America	Biron	409	–	–	409	–	–	–
Stora Enso North America	Kimberly	50	–	–	50	–	–	–
Stora Enso North America	Niagara	250	–	–	250	–	–	–
Stora Enso North America	Stevens Point	251	–	–	251	–	–	–
Stora Enso North America	Wisconsin Rapids	1,200	–	1,200	–	–	–	–
Wausau-Mosinee Paper Corp.	Brokaw	265	265	–	–	–	–	–
Wausau-Mosinee Paper Corp.	Mosinee	285	–	285	–	–	–	–
Weyerhaeuser	Rothschild	152	152	–	–	–	–	–
Total	17 mills	6,038	817	2,267	1,497	1,378	79	–
Lake States total	33 mills	15,071	817	7,105	2,672	3,058	79	1,340

Table 10.--Annual production of active particleboard and panel mills in the Lake States by State, company, location, and product produced, 1999

(In million square feet 3/4-inch basis)

State and company	Location	Product produced	Annual production
Michigan			
Georgia-Pacific	Gaylord	Particleboard	256
Louisiana-Pacific Corp.	Newberry	Oriented strand board	65
Louisiana-Pacific Corp.	Sagola	Oriented strand board	180
Weyerhaeuser	Grayling	Oriented strand board	228
Total	4 mills		729
Minnesota			
Louisiana-Pacific Corp.	Two Harbors	Oriented strand board	60
Northwood Panelboard Corp.	Solway	Oriented strand board	200
Potlatch Corp.	Bemidji	Oriented strand board	260
Potlatch Corp.	Cook	Oriented strand board	125
Potlatch Corp.	Grand Rapids	Oriented strand board	180
Trus Joist	Deerwood	Laminated structural lumber	n/a
Total	6 mills		825
Wisconsin			
Louisiana-Pacific Corp.	Hayward	Oriented strand board	250
Louisiana-Pacific Corp.	Tomahawk	Oriented strand board	55
Rodman Industries	Marinette	Particleboard	13
Weyerhaeuser Co.	Marshfield	Particleboard	79
Total	4 mills		397
Lake States total	14 mills		1,951

Table 11.--Production and imports of pulpwood, Central States, 1999

(In standard cords, unpeeled)

Product form, species group, and destination	Production by State[1]				Regional total	Imports		Total imports	Total receipts
	Illinois	Indiana	Iowa	Missouri		Lake States	Other U.S.		
Roundwood									
Softwoods									
Lake States	165	–	1,278	–	1,443	–	–	–	–
Northeastern States	–	3,953	–	–	3,953	–	–	–	–
Southern States	3,755	–	–	1,132	4,887	–	–	–	–
Total	3,919	3,953	1,278	1,132	10,283	–	–	–	–
Soft hardwoods[2]									
Central States	5,948	8,872	4,610	8,249	27,678	–	–	–	27,678
Northeastern States	–	117	–	–	117	–	–	–	–
Southern States	9,874	4,599	–	3,963	18,436	–	–	–	–
Total	15,822	13,588	4,610	12,213	46,232	–	–	–	27,678
Hard hardwoods[3]									
Central States	3,690	18,140	2,018	325	24,172	–	–	–	24,172
Northeastern States	–	53	–	–	53	–	–	–	–
Southern States	31,516	13,734	–	72,521	117,771	–	–	–	–
Total	35,206	31,927	2,018	72,846	141,997	–	–	–	24,172
Total all roundwood									
Central States	9,638	27,011	6,627	8,574	51,850	–	–	–	51,850
Lake States	165	–	1,278	–	1,443	–	–	–	–
Northeastern States	–	4,124	–	–	4,124	–	–	–	–
Southern States	45,144	18,333	–	77,617	141,094	–	–	–	–
Total	54,947	49,468	7,905	86,191	198,511	–	–	–	51,850
Residues									
Softwoods									
Central States	–	–	15,120	–	15,120	–	6,480	6,480	21,600
Southern States	20	61	–	4,572	4,653	–	–	–	–
Total	20	61	15,120	4,572	19,773	–	6,480	6,480	21,600
Hardwoods									
Central States	12,072	46,291	7,359	3,049	68,771	1,492	178	1,669	70,441
Lake States	–	14,064	3,465	–	17,529	–	–	–	–
Northeastern States	–	1,503	–	–	1,503	–	–	–	–
Southern States	12,354	64,189	–	83,452	159,995	–	–	–	–
Total	24,425	126,047	10,824	86,501	247,798	1,492	178	1,669	70,441

Total all residues									
Central States	12,072	46,291	22,479	3,049	83,891	1,492	6,658	8,149	92,041
Lake States	–	14,064	3,465	–	17,529	–	–	–	–
Northeastern States	–	1,503	–	–	1,503	–	–	–	–
Southern States	12,374	64,250	–	88,023	164,648	–	–	–	–
Total	24,445	126,108	25,944	91,073	267,570	1,492	6,658	8,149	92,041
Total all wood material									
Central States	21,709	73,302	29,107	11,624	135,742	1,492	6,658	8,149	143,891
Lake States	165	14,064	4,743	–	18,972	–	–	–	–
Northeastern States	–	5,626	–	–	5,626	–	–	–	–
Southern States	57,518	82,584	–	165,640	305,742	–	–	–	–
Total	79,392	175,576	33,850	177,264	466,082	1,492	6,658	8,149	143,891

[1] Vertical columns of figures under the box heading "Production by State" present the amount of roundwood cut or residue generated in each State.

[2] Hardwood species with an average specific gravity of 0.50 of less.

[3] Hardwood species with an average specific gravity greater than 0.50.

Table may not add due to rounding.

Table 12.--Central States pulpwood production by product form and species group, 1995-1999

(In thousand standard cords, unpeeled)

Product form and species group	1995	1996	1997	1998	1999
Roundwood					
Softwoods	9,742	16,993	10,269	18,680	10,283
Soft hardwoods[1]	32,480	89,638	86,312	34,475	46,233
Hard hardwoods[2]	89,316	60,817	66,818	126,197	141,997
Total	131,538	167,446	163,396	179,351	198,511
Residues					
Softwood	38,037	2,159	19,259	38,176	19,773
Hardwood	358,105	223,390	229,796	254,747	247,798
Total	396,143	225,550	249,056	292,923	267,570
Total all wood material	527,682	392,999	412,452	472,275	466,082

[1] Hardwood species with an average specific gravity of 0.50 of less.

[2] Hardwood species with an average specific gravity greater than 0.50.

Table may not add due to rounding.

Table 13.--Central States pulpwood production by State and destination, 1995-1999[1]

(In thousand standard cords, unpeeled)

Year	Illinois			Indiana			Iowa			Missouri		
		Destination			Destination			Destination				
	Total	Central States	Other States	Total	Central States	Other States	Total	Central States	Other States	Total	Central States	Other States
1995	81	33	48	310	212	98	23	22	2	113	12	101
1996	95	53	41	149	44	105	23	22	1	126	11	115
1997	70	21	49	175	70	105	35	31	4	133	11	122
1998	79	20	59	183	68	115	34	29	5	176	13	163
1999	79	22	58	176	73	102	34	29	5	177	12	166

[1] Includes mill residues used for pulp.

Table may not add due to rounding.

Table 14.--Average daily production of active wood pulp mills in the Central States by company, location, and type of pulp produced, 1999

(In tons per 24 hours)

Company	Location	Average daily production	Type of pulp	
			Groundwood/ mechanical	Semi-chemical
International Paper	Terre Haute, IN	573	–	573
Four M Paper Corp.	Fort Madison, IA	118	–	118
Jeld-Wen Fiber Of Iowa	Dubuque, IA	80	80	–
Huebert Fiberboard Co.	Boonville, MO	120	120	–
Central States total	4 mills	891	200	691

Piva, Ronald J.

2003. **Pulpwood production in the North-Central Region, 1999.** Resour. Bull. NC-214. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 58 p.

Discusses 1999 production and receipts in the Lake, Central, and Plains States. Shows Michigan, Minnesota, and Wisconsin production by species for each county and compares production by Forest Survey Unit with that of previous years. Presents production data for Illinois, Indiana, Iowa, and Missouri by species group and product form. Includes 1999 production for the Plains States by species group and product form.

KEY WORDS: Roundwood, whole-tree chips, residue, pulpwood, particleboard, Michigan, Minnesota, Wisconsin, Illinois, Indiana, Iowa, Missouri, Plains States.

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